



Modeling Strategic Interventions in a Population With a Total Fertility Rate of 8.3: A Cross-Sectional Study of Idjwi Island, DRC - With Appendix Detailing Patterns of Poverty and Disease Among the Bany'Idjwi People

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COLLABORATORS AND ROLES

The following individuals contributed to this project as described below. Both Michael Hadley and Dana Thomson are listed as first authors in the publication of this work in BMC Public Health 2012, 12:959.

Michael Hadley: Grant proposals and IRB. Questionnaire design and translation. Survey sampling methodology and data weighting (with Dana). All fieldwork, including management of local team, trips to catchment areas, focus groups, key informant interviews. All descriptive statistics. TFR modeling (with Dana). Composition of final manuscript (with Dana).

Dana Thomson: Survey sampling methodology and data weighting (with Michael). Historical population trends on Idjwi. TFR modeling (with Michael). Composition of final manuscript (with Michael).

Marcia Castro, PhD: Advisement of study design and data analysis. Assistance in securing funding for research and publication. Editing of final manuscript.

Gregg Greenough, MD: Early advice on study design. Editing of final manuscript.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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ABSTRACT

Background

Idjwi, an island of approximately 220,000 people, is located in eastern DRC and functions semi-autonomously under the governance of two kings (*mwamis*). At more than 8 live births per woman, Idjwi has one of the highest total fertility rates (TFRs) in the world. Rapid population growth has led to widespread environmental degradation and food insecurity. Meanwhile family planning services are largely unavailable.

Methods

At the invitation of local leaders, we conducted a representative survey of 2,078 households in 50 sampling areas in accordance with Measure DHS protocols, and separately interviewed women about sexual- and gender-based violence and access to health services. We also interviewed local leaders and health care professionals about the health system. The household survey measured women's unmet need for contraception, desired number of children, and desire to use contraceptives, among other health outcomes. Modeling proximate determinates of fertility, we predicted how the introduction of contraceptives and/or extended periods of breastfeeding could reduce the TFR.

Results

Interviews revealed that Idjwi's extremely high fertility is associated with a weak health care system, poor funding, deteriorating infrastructure, and discrimination and violence against women. In the survey, over half of all women reported an unmet need for spacing or limiting births, and nearly 70% of women named a specific modern method of contraception they would

prefer to use: pills (25.4%) and injectables (26.5%) were most desired. Based on women's fertility behaviors and desires, we predicted that an increase in contraceptive prevalence (from 1% to 20%) or an increase in the average length of breastfeeding (from 10 to 14 months) could reduce TFR on Idjwi to 5 children per woman, and reduce unmet need for contraception by up to 11%. Of these interventions, Idjwi's women most prefer improved access to modern contraception.

Conclusions

To improve the status of women and curb unsustainable population growth, we recommend adding family planning services at health centers with NGO support, reaching out to women during regular medical and maternal health visits, pursuing a community health worker program, promoting extended periods of breastfeeding, and implementing comprehensive community-based programs to end sexual- and gender-based violence toward women. Lessons from Idjwi may be applied to other densely populated, low-income settings with high fertility.

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GLOSSARY

ArcGIS: Software by ESRI used for statistics and data mapping. www.esri.com/software/arcgis

Bany’Idjwi: The people of Idjwi Island.

Batwa: The indigenous, marginalized, “Pygmy” inhabitants of Central Africa who live interdependently with Bantu populations.

Child mortality: Number of children annually who die by age 5 per thousand live births.

DRC: Democratic Republic of the Congo.

DHS: Demographic and Health Survey. DHS is a gold standard for nationally representative health surveys around the world. DHS last surveyed the DRC in 2007.

Idjwi Island: Africa’s second largest island, situated in Lake Kivu in eastern DRC.

Ki’Havu: The language spoken at home by residents of Idjwi Island. All surveys and interviews were conducted in Ki’Havu.

KISH table: A pre-assigned table to random numbers used to select interviewees.

LandScan: High-resolution population density maps based on satellite imagery from Oak Ridge National Laboratory. <http://web.ornl.gov/sci/landscan/>

Maternal mortality: Number of maternal deaths annually per 1000 women of reproductive age.

Mwami: Translates as “king” in Ki’Havu. The mwami is the traditional, nonelected leader of the community. Idjwi has a Mwami of the north and a Mwami of the south.

PPP: Purchasing power parity.

TFR: For a given population, Total Fertility Rate is the average number of children born to a woman over a full reproductive lifespan assuming current age-specific fertility rates.

Unmet need for contraception: A measure of demand for contraception that would exist in a society if all women had geographic, economic, and social access to family planning.

INTRODUCTION

Background

Idjwi, Africa's 2nd largest inland island (106 sq. mi.), is located in Lake Kivu in eastern Democratic Republic of Congo (DRC) on the periphery of DRC's civil conflict (Figure 1). While family planning services have become widely available across Africa, they remain nearly absent on Idjwi. With a total fertility rate (TFR) of 8.3 births per woman, and roughly 2,075 people living per square mile, high population density and rapid population growth are often associated with environmental degradation and major nutritional deficiencies on Idjwi.

In 2010, at the invitation of Idjwi's leaders, a multidisciplinary team from Harvard's public health, medical, policy, and design schools performed a health needs assessment to guide improvements to Idjwi's health infrastructure, and attract attention and resources to the island's increasingly dire health situation. To provide community leaders, government officials, and aid organizations with actionable information, this health assessment included a population-based household survey, key informant interviews, focus groups with vulnerable subpopulations, and the creation of the first cartographic map of the island. To the best of our knowledge, the household survey was the first of its kind on Idjwi, both in terms of the breadth of health topics covered and its representativeness of communities across the island.

This comprehensive assessment identified several urgent health problems; among the most urgent was lack of family planning services. Not only are sexual and reproductive health services core to the provision of public health [1], a lack of family planning services is intimately related to several other identified health concerns including sexual- and gender-based violence against women [2], poor child health [3], and household food insecurity from population pressure [4].

Health, population and fertility

Few sources of information about Idjwi health conditions were available before this assessment. Published studies identified extremely high fertility rates [5] and endemic goiter prevalence [6] in the 1970s, low HIV seroprevalence in the 1980s [7], and low healthcare utilization in the 1990s [8]. Missionary groups described worse health outcomes among the island's minority Batwa (Pygmy) population compared to the general population [9], and international advocacy groups reported high maternal mortality, poor infant and child health, malnutrition, high rates of infectious diseases, and poor health infrastructure [10,11]. A national Demographic and Health Survey (DHS) conducted in the DRC in 07 did not include Idjwi [12].

Limited demographic data show alarming population trends for Idjwi over the last century. Consistently high fertility and immigration, combined with the island's fertile soil and regular rainfall (55 ± 8 inches annually) [5] supported annual population growth rates ranging from 2.9% to 3.3% between 1929 and 1994 (Figure 2) [5,13]. In the 1950s, TFR in South Kivu province was 8.5, and it has remained high since [14]. During the 1994 Rwandan Genocide, Idjwi's population increased 41% when 46,000 Rwandan refugees, mostly women and children, fled to the island [13]. Since the mid-1990's, many Congolese have also moved to Idjwi fleeing the conflict in mainland DRC. In 2001, LandScan population estimates put Idjwi's population just under 180,000 [15]. Based on these trends and an annual growth rate of 2.2% since 1994, we estimated Idjwi's population to be approximately 220,000 in 2010. Satellite imagery from 2009 [16] and field observations in 2010–2012 revealed extensive deforestation.

Barriers to health and family planning

Many factors limit the provision of family planning services on Idjwi. The island's health personnel, infrastructure, supplies, financing, and outreach programs are insufficient to meet

local needs. The health system receives no support from the Congolese government and relies entirely on user fees and foreign assistance. In interviews, local health practitioners acknowledge the need for family planning, but said they were reluctant to discuss the topic with patients if their practices had no regular supply of contraceptives. Additionally, most women visit health centers only for perinatal or emergent care, and many rely entirely on traditional and home remedies. As a result, the health system provides few women with family planning options or information (Table 1).

Sociopolitical factors also limit access to family planning. In focus groups, women argued that poverty, limited education, geographic isolation, patrilineal inheritance, normalization of violence, lack of formal justice systems, and absence of women in government all buttress social conservatism and suppress women's reproductive rights. In other similar settings, women's disempowerment in terms of limited decision-making power within intimate relationships [17,18], violence against women [19], and low education [20] limited access to reproductive health services, and promoted high fertility. Furthermore, half of the island's population is devout Catholic, and local priests maintain that condoms, injections, and other "unnatural" forms of contraception are forbidden.

Fertility transition

Evidence of high fertility and high mortality on Idjwi indicates that this population has not yet entered a fertility transition. Fertility transitions are generally preceded by a reduction in child mortality [21,22], and are accompanied by improvements to health and economic conditions including women's increased access to education and economic opportunities [23]. Access to contraception, especially among young women, is critical for woman to be able to control fertility and leverage educational and economic opportunities [24]. In the case of Idjwi,

access to contraception is not only a geographic and economic challenge, but also a social one; effective family planning programs put women solely in charge of their own fertility decisions which may have previously been influenced by husbands and extended family [25]. In societies where women have limited control over their own fertility, practicing extended periods of breastfeeding can help to lower fertility levels [26]. Where violence against women is widespread, programs that educate men about reproductive health, and engage men in conversations about gender equity have made headway in promoting women's reproductive health and empowerment [27].

In this context of poverty, high fertility, and social marginalization, we investigated women's needs and desires for family planning, and modeled scenarios to meet these needs based on proximate determinants of fertility. We discuss results and make evidence-based, actionable recommendations drawing on the literature as well as key informant interviews and focus-groups conducted in Idjwi communities.

METHODS

Household survey data

We conducted a representative household survey of 2,078 women age 18 to 50 from 50 randomly selected sampling units across Idjwi. We used LandScan population estimates [15] and satellite imagery [16] to select a one-stage cluster sample. LandScan estimates were generated by an algorithm that allocates census figures to one square kilometer grid cells based on land surface characteristics identified by satellite images. Using ArcGIS 9.3 (ESRI, Redlands, CA), we generated 5,293 geographic coordinates in proportion to the population density in each of the 383 grid cells, resulting in 1 to 242 coordinates per grid cell. We then randomly selected 50 coordinates without replacement, allowing two or more coordinates to fall in the same grid cell. Using Google Earth, we delineated sampling areas around the approximately 45 closest dwellings to each selected coordinate, and used this information to create a field navigation map of roads, paths, and sampling units (Figure 3). In the field, interviewers started at the center of each sampling area and performed interviews at every household encountered within the sampling area boundary, regardless of accessibility. We aimed to complete 45 interviews in each sampling area, although the actual number ranged from 40 to 48.

Eligible households were defined as having one female resident between the age of 18 and 50. A number of households were headed by a woman under the age of 18 and could not be interviewed per the internal review board (IRB) requirements of our study. If the household had more than one eligible woman, the interviewer used a simplified KISH table [28] to select one woman at random. If the selected woman was not present or unable to complete the interview, the interviewer followed up with the woman at an agreed upon time. The timing of the survey during Idjwi's dry season meant that women were more likely to be at home rather than working

in the fields. No respondents refused to participate.

The household survey was modeled on the Standard MEASURE DHS Women's and Household Questionnaires [29,30] with additional items incorporated from the WHO World Health Survey Household and Individual Questionnaires [31], the Women's Health Study of Accra Questionnaire [unpublished], and the Harvard School of Dental Medicine Global Oral Health Survey [unpublished]. The resulting Idjwi demographic and health survey was approved by the Harvard School of Public Health Office of Human Research Administration and by Idjwi officials.

Following MEASURE DHS guidelines [32], we trained 41 local female interviewers age 17 to 27, and seven local male and female survey team leaders. The survey was administered verbally in Ki'Havu, the only language that is spoken by all people on Idjwi. Questions were translated from English to Ki'Havu and then back translated by two independent groups of English teachers. The Ki'Havu version was tested on Idjwi, and modified for clarity to reflect the range of local responses. For potentially distressing topics such as domestic violence and rape, we asked respondents about general problems in their community rather than their personal experiences. We collected complete birth histories from each respondent, along with prenatal and postnatal care information, household characteristics, individual socioeconomic characteristics, and reproductive health practices and beliefs. Throughout the survey process, we met with leaders (the island's two Mwamis, the archbishop of South Kivu, and village chiefs) and citizens to explain the purpose of the survey and address questions and concerns.

We employed sampling weights in our analysis to adjust for differences in the number of households interviewed in each sampling unit. Since some households had multiple eligible women, additional weights were applied in the calculation of women's health indicators. Weights were calculated as:

$$\text{Household weight} = \frac{1}{\left(\frac{c*50}{C}\right)\left(\frac{i}{P/h}\right)} \quad (1)$$

$$\text{Women weight} = \text{Household weight} * \frac{1}{w} \quad (2)$$

where:

c = number of selected coordinates in LandScan cell
 C = total potential coordinates
 i = number of households interviewed in LandScan cell
 P = total estimated population in LandScan cell
 h = average household size in LandScan cell
 w = number of women in household

Key informant data

In June through August of 2010, 2011 and 2012, we performed interviews and focus groups with key informants and members of vulnerable subpopulations to understand the sociopolitical context, potential drivers of poor health outcomes, and perspectives about how to improve health. Key informant interviews were iterative and relied on snowball sampling to identify local leaders in government, agriculture, trade, education, health care, religion, civics, women's rights, justice, and security. Focus groups also used snowball sampling to identify 20 groups of 8–12 individuals from vulnerable groups across the island, including women, Batwa (pygmies), and communities far from health services. Interviews and focus groups were conducted in Ki'Havu by a member of the research team assisted by a translator from Idjwi. Sessions focused on determinants and solutions to problems identified by participants. All participants were over age 18, and gave free and informed consent.

Primary outcomes: preference and need for family planning

There are two main outcomes of interest. The first, “preference for contraception,” is the percent of women who said they would like to use a specific method of contraception if given the option [33]. The second, “unmet need for contraception,” is a widely accepted measure of demand for contraception that would exist in a society if all women had geographic, economic, and social access to family planning services [25]. A woman is considered to have an unmet need for family planning if she wishes to space or limit her births now or in the near future but is unable [33] (see Figure 4).

Secondary outcomes: proximate determinants of fertility

Demographers model fertility using proximate determinants through which more distal factors, such as women’s empowerment and education, affect the timing and number of births [34]. We use Stover’s five fertility indices [35] based on Bongaarts’ seminal work [36] to understand the relative influence of each proximate determinant on Idwi’s current fertility level, and to assess how hypothetical scenarios of increased contraceptive use and breastfeeding could reduce future fertility rates. The indices are defined and measured as follows; the closer the index value to zero, the more influence that proximate determinant has on fertility in the population:

1. Sexual activity index (Cx) is the percent of women who report being sexually active or have had vaginal intercourse in the last month.
2. Infecundity index (Cf) is derived from the number of sexually active women who are fecund, which includes women who have had a pregnancy in the last five years, are not pregnant, and are not experiencing post-partum lactational amenorrhea (f).

3. Postpartum infecundability index (Ci), is based on i, the number of months a woman reported lactational amenorrhea after her last pregnancy. In our survey, we did not ask about lactational amenorrhea, and instead of total months of breastfeeding, we asked about exclusive breastfeeding. As lactational amenorrhea is closely linked with the period of exclusive breastfeeding, we used exclusive breastfeeding as a proxy for the length of postpartum infecundability.
4. Current contraceptive prevalence index (Cu) is the percent of women currently using modern or traditional contraception, and the average effectiveness of those methods. In the Idjwi survey, we asked women if they had ever used modern or traditional methods of contraception. Because contraception is essentially unavailable, we did not ask about current use. Less than 7% of women reported ever using any form of modern contraception (Table 1), and even fewer reported ever using withdrawal (2.5%) or the calendar method (3.7%). For modeling of proximate determinants, we used a generous estimate of 1% current contraception prevalence (u), and an average effectiveness rate (e) of 95% suggested by Stover [28].
5. Induced abortion (Ca) is the fifth proximate determinate in Stover's model, though it is difficult to measure in household surveys because women tend to under-report induced abortion due to strong social stigma and laws prohibiting the practice [37]. Abortion is illegal in DRC except to save the life of the woman, and is not offered at any health facilities on Idjwi. Many demographers believe that induced abortion is rare to non-existent in high-fertility, resource-poor settings [38]. Previous research [5] and our qualitative work found that abortion, although rare and strongly disregarded, is practiced on Idjwi, often with the assistance of traditional healers. Interviews with leadership of UFIN, Idjwi's premier women's rights organization, suggest that "at least 1%" of women

have had unsafe abortions, and that most women know how to get an abortion. Assuming that women who have induced abortions have only one, the induced abortion index is 0.9988, which rounds to 1, and conforms to standard modeling assumptions that the abortion rate is essential zero.

Stover's proximate determinants model also includes a potential fertility (PF) term equal to 21 which is the theoretical maximum number of children a fecund woman could physically bear if she remained sexually active the entire time between ages 15 and 49 with no constraints on her fertility. The model of total fertility is:

$$TFR = Cx * Cf * Ci * Ca * Cu * PF$$

Of the five proximate determinates, contraceptive prevalence and length of breastfeeding can be feasibly altered with family planning programs and policies. Using this model, we assess the effect of moderate increases in contraceptive use and longer periods of breastfeeding on TFR and women's unmet need for family planning.

RESULTS

Household characteristics

Table 2 summarizes household characteristics for this sample of 2,078 women. Although households earn a monthly average US\$60.97 purchasing power parity (PPP) in hard currency, the disparity between the poorest and wealthiest households is striking. The wealthiest 20% of households earn US\$293.25 PPP in hard currency each month, 1,600 times more than the poorest 20% of households which earn just US\$0.18 PPP in hard currency each month. These figures do not include land holdings and other forms of non-monetary wealth, which suggests that the disparity between the richest and poorest is likely greater. Chronic food insecurity exists in 26% of households, and periodic food shortages are a problem in another third.

Reproductive health and empowerment

Given existing fertility trends on Idjwi, a woman who survives adulthood is expected to have 8 births throughout her lifetime (TFR=8.3). Table 1 summarizes women's reproductive health outcomes and empowerment experiences. Contraceptive use is extremely low. Of women who have ever used a modern method (6.5%), most have used pills (50.6%) or injectables (40.3%). Only 14% of women reported that a health worker talked to them about family planning in the last year. Women reported exclusively breastfeeding for an average of 6.1 months, compared to just 1.7 months in the rest of South Kivu province [12]. Using Bongaarts' equation relating length of breastfeeding to post-partum infecundability [36], we estimated that Idjwi women breastfeed nonexclusively for a total of 10.4 months. Women's reproductive lives start early. Sixteen percent of women reported having their first intercourse between ages 10 and 14, and the average age at first intercourse was 16.8 years. On average, women moved in with their

first husband/partner and had their first child before age 18, which constitutes statutory rape under Congolese law. Thirty percent of women reported having sex before moving in with their husband/partner. Fifteen percent of women were in polygynous marriages.

We also asked women about their understanding of violence in the community. Forty percent reported it was common or very common for a woman to be forced by her husband/partner to have sex, and 36% reported it was common or very common for a woman to be forced into sex by someone other than her husband/partner. In interviews, leaders of Idjwi's premier women's organization, UFIN, estimated that 70% of married women have been physically beaten by their husbands. They added that "many women are beaten to the point where they needed medical attention," sometimes so badly that they "risk miscarrying their fetus". Violence against women appears to be a community norm. The majority of survey respondents believed a husband is justified to beat his wife if she goes out without telling him (80.4%), neglects the children (76.0%), argues with him (68.3%), refuses to have sex with him (69.6%), or burns the food (57.8%). These figures are comparable, and in some cases worse than, mainland DRC [12].

Preference for contraception

We asked women about the total number of children they wished to have and desired use of contraceptives, though these were likely perceived as abstract questions given how little control women have over their own fertility. Women reported wanting 6.1 children on average, approximately two children less than the current fertility level. Seven in ten women named a specific modern method of contraception they would prefer to use if given the option; most said pills (25.4%) or injections (26.5%) (Table 3). Most women preferred modern contraception to breastfeeding.

Unmet need for contraception

Figure 4 outlines the criteria that resulted in 1,140 fecund, pregnant, or amenorrheic women with an unmet need for contraception. Women who reported an unmet need for spacing or limiting future births were asked to explain why they were not currently using a method of contraception. Women were able to give up to 20 precoded reasons, as well as describe other reasons (later coded), or simply say “I don’t know.” Over 900 women gave at least one reason for not using contraception and most women gave two to five reasons (Table 4). The most common reasons cited were currently breastfeeding (21.7%), cost too much (20.5%), not knowing where or how to obtain contraception (18.9%), not knowing which contraceptive methods are available (18.3%), husband’s opposition to use of contraception (15.9%), and fear of side effects from taking contraception (15.6%).

Proximate determinants of fertility

Using the proximate determinants framework, we modeled Idjwi’s TFR to be 9.86, which is greater than TFR measured by our survey (8.3). This is likely due to under-estimation of TFR in our sample, as well as some imprecision in our estimates of proximate determinants. Despite these challenges, the model adequately captures the relative impact of each proximate determinant on fertility, which we report (Figure 5). Of the five proximate determinants, fertility is most influenced by the proportion of sexually active women who are unable to become pregnant ($C_f=0.874$), length of breastfeeding ($C_i=0.812$), and the proportion of women who are sexually active ($C_x=0.668$). Induced abortion ($C_a=1$) and contraceptive prevalence ($C_u=0.991$) currently play little role in determining fertility. These figures coincide with settings where there are no limits on fertility and contraceptive use is virtually zero [38].

Figure 5 presents different scenarios for reducing TFR on Idjwi by extending average

length of breastfeeding and contraceptive prevalence. For example, the desired TFR of 6 could be achieved by extending average length of breastfeeding from 10 to 21 months, increasing contraceptive prevalence to 30%, or some combination of both (e.g., extending average length of breastfeeding to 15 months and providing contraception to 20% of the Island's sexually active fecund women). Women in focus groups expressed preference for use of modern contraception over extended breastfeeding. Figure 4 suggests that a modest increase in contraceptive prevalence to 15% could reduce unmet need for family planning by 8% (from 54.8% to 46.6%).

DISCUSSION

Securing the right to contraception

Our results derive from what we understand to be the first representative household survey of health on Idjwi Island, DRC. We found very high fertility and extremely limited access to modern contraceptives. More than half the women on Idjwi had an unmet need for contraception, and over two thirds had an expressed desire to use modern contraceptives. The vast majority of women were uninformed about the advantages of having smaller families, unfamiliar with options to control fertility, and socially disempowered to make decisions about their own reproductive health. Using a proximate determinates model of fertility, we predicted that modest increases in contraceptive prevalence and extended periods of breastfeeding could meet women's demand for family planning by reducing the TFR to 6 or fewer children per woman, while also curbing population growth and preventing further pressure on the environment.

From a public health perspective, there is a strong imperative to translate findings to practical solutions [39]. Here, we discuss several ways to meet women's individual needs for family planning to achieve personal fertility preferences, and reduce the fertility rate at a population level. We use perspectives from key informant interviews and focus groups on Idjwi, as well as the scientific literature, to formulate specific recommendations in the areas of women's empowerment and improved health services.

Perspectives from Idjwi

In interviews, local leaders across sectors express that high fertility is a consequence of poverty and gender roles. Most households wish to send their sons and daughters to school, but

cannot afford to send everyone. Households often choose to send sons to school because sons traditionally stay with the family to protect and provide for relatives, while daughters are married off to other families. As a result, girls receive less education than boys, have fewer career prospects, and marry early into a life of disempowerment and high fertility. To local leaders, empowering women and reducing fertility requires lifting households out of poverty so that all children can attend school. The critical ways to reduce household poverty on Idjwi, according to local leaders, is to afford residents greater access to credit, create cash crop cooperatives that sell to global markets, and provide education and supplies to help farmers increase their crop yield. Ultimately, this is a long-term path toward sustained income growth, higher education enrollment, women's empowerment, and decreased fertility.

Local officials agree on several short-term solutions for empowering women and decreasing unmet need for family planning. First, many informants advocated for skills-training programs for uneducated, married women (e.g., nursing, cooking, tailoring, and typing). Programs would provide women with a source of income, granting them greater control in their relationships and health care decisions. Second, in the absence of Congolese support, local leaders advocate for aid organizations to provide universal free access to contraceptives and education around family planning. To decrease unmet need on Idjwi, they argue that women and men need the opportunity to learn about the use and safety of contraceptives, and have the freedom to choose a contraceptive method regardless of income.

Perspectives from the scientific literature

Evidence from countries that have transitioned from high to low fertility suggest that reductions in child mortality are often a prerequisite for lowering fertility preferences [21], although this is not a necessary condition (e.g., France observed sustained reductions in fertility

prior to mortality declines) [40]. We do not report child mortality statistics here because we have evidence of under-reporting of child deaths in our survey. Assuming that under-five mortality on Idjwi is at least as high as the rest of South Kivu province at 186 deaths per 1000 live births [12], the literature suggests that improving child survival is key to reducing the TFR.

Education, particularly of young women, empowers them to meet their desired fertility levels [41,42], and in the long term, will likely influence them to desire smaller families [41]. Women who can control their own fertility are positioned to make decisions about their own education, work, and health care, and can develop social roles outside of raising children. Education for women also has a positive impact on their children's health. Women who have at least a secondary education generally wait longer to have their first pregnancy and space their births, resulting in healthier children [4]. Education of women is also associated with lower rates of domestic violence and greater female empowerment [43].

Recommendations

Based on our results and perspectives from the literature and the field, we recommend interventions that empower women with education; increase geographic, economic, and social access to modern contraception for women and men; promote extended periods of breastfeeding; and reduce child mortality. We call upon implementers of family planning programs and policies to be cognisant of Idjwi's social and economic inequalities, and to attempt equity and fairness in the provision of family planning services by reaching out specifically to poor women and Batwa women. We also suggest that men be engaged with reproductive health information and services.

Women's empowerment

A suite of programs are needed to empower women to obtain education and economic

opportunities, and to minimize social inequalities and violence against women. We recommend (1) providing legal support to women to seek justice against perpetrators of sexual violence; (2) promoting discussions and practice of gender equality in community institutions such as churches and schools; (3) creating safe spaces for men to investigate masculinity and to practice respectful behaviors toward women; and (4) integrating gender justice programs into classrooms and afterschool activities [44].

Our results indicate that extending the average period of breastfeeding by just a few months can reduce total fertility on Idjwi. Breastfeeding education campaigns empower women who wish to control their birth spacing but who are unable to access, or prefer not to use, modern contraception, with the important additional benefit of improving child nutrition and survival [26]. New and expecting mothers can be reached during antenatal care visits, via public campaigns, and at facility-based deliveries with information about the effects of extended breastfeeding on birth spacing and child health [45].

Health services

Family planning services require access to contraceptives and trained medical personnel. In interviews, local leaders affirmed they would welcome partner organizations to improve quality and quantity of health services. We recommend that organizations working in eastern DRC approach Idjwi clinic administrators about providing contraceptives and training personnel. Women on Idjwi would most prefer provision of modern contraceptives, particularly pills and injectables that could be kept secret from men. Our model predicts that increasing the prevalence of modern contraception to 30% would reduce fertility to the desired level of 6 children per woman.

In addition to making family planning services available, we recommend taking

advantage of all interactions with female patients to inform them about contraception and breastfeeding. Our survey indicated that over 90% of women visited a health center or hospital on Idjwi during the last year (not shown)—and yet, large portions of women with an unmet need for contraception cited lack of knowledge about how contraceptives work, contraceptive options, and where to obtain contraceptives as reasons for not using contraception (Table 4).

Finally, we recommend the development of a community health worker program that offers basic family planning, and maternal and child health services based out of Idjwi's health centers, ensuring that community health workers are compensated and supported with adequate resources to promote worker quality and retention [46]. In other low-resource settings, paid community health workers play an integral role in educating the public about family planning, delivering contraceptives, and providing basic child health services such as life-saving oral rehydration therapy to children with diarrhea [47,48]. Community health programs that involve men through group discussions and provision of health services show greater improvements in women's reproductive health outcomes than programs that provide services to women alone [23].

Strengths

Our sampling approach resulted in a representative sample of Idjwi. By following gold-standard practices for training local interviewers and conducting respectful, standardized interviews, we built trust in the communities we sampled and collected a rich dataset to inform Idjwi health policies and programming. We also conducted extensive ethnographic data collection to provide local context for the results, and included community perspectives in our recommendations.

Limitations

The internal review board required that only “adults” be interviewed, and the legal age of adulthood in the DRC is 18. This restriction may create biases, since women on Idjwi marry, start households, and begin having children before the age of 18, and teen mothers in similar settings have greater reproductive health needs and poorer social, economic, and health outcomes than adults [49]. Although the statistics presented here are bleak, reproductive health needs on Idjwi may be even greater once the outcomes of young women are included. Yet, our findings based on adults aged 18 and above, and the recommendations put forth, are likely to be equally valid for young adults. Additionally, this study did not interview men about their fertility preferences, or their sexual health attitudes, knowledge, and behaviour which is important for designing interventions that include men.

SUMMARY

Our findings present a fresh look at critical population problems faced on Idjwi. With extremely high fertility and virtually no availability of contraceptives, there is much room for improvement in family planning services. By exposing Idjwi's needs and challenges on the basis of solid evidence, we expect that more attention will be devoted to the empowerment of women to control their own fertility, and that organizations working in eastern DRC will extend their support to programs that improve Idjwi's healthcare system, including family planning services, child survival, and women's empowerment. This study provides a framework for quantifying demand for family planning and using a proximate determinates model of fertility to evaluate the potential effects of various family planning intervention scenarios in a low-resourced environment.

REFERENCES

1. Glasier A, Gülmezoglu AM, Schmid GP, Moreno CG, Van Look PF: Sexual and reproductive health: a matter of life and death. *Lancet* 2006, 368:1595-1607. PubMed PMID: 17084760.
2. Moore M. Reproductive health and intimate partner violence. *Fam Plann Perspect* 1999, 31:302-306. PubMed PMID: 10614521.
3. Jensen E, Westley SB: Do family planning programs enhance children's health? *Asia Pac Pop Policy* 1996, 38:1-4. PubMed PMID: 12291538.
4. Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J: Family planning: the unfinished agenda. *Lancet* 2006, 368: 1810-1827. PubMed PMID: 17113431.
5. Caraël M, Stanbury JB: Promotion of birth spacing in Idjwi Island, Zaire. *Stud Family Plann* 1983, 14:134-142. PubMed PMID: 6192558.
6. Thilly C, Delange F, Vis HL, Ermans AM: Endemic goiter and cretinism on Idjwi Island: public health problems. *Brux Med* 1971, 51:693-699. PubMed PMID: 5150515.
7. Courtois X, Baccard-Longere M, Dibi K: Detection of HIV antibodies in a rural region of a developing country. *Bull Soc Pathol Exot* 1991, 84:128-132. PubMed PMID: 1914042.
8. Courtois X, Dumoulin J: Sale of drugs and health care utilization in a health care district in Zaire. *Health Policy Plan* 1995, 10:181-186. PubMed PMID: 10172351.
9. Bideri C, Hergum HP: The Pygmies of the Great Lakes
[www.kirkensnodhjelp.no/Documents/Kirkens%20N%C3%B8dhjelp/Publikasjoner/Temahefter/The%20pygmies%20of%20the%20great%20lakes.pdf]
10. 3TAMIS: Two rehabilitated hospitals to open on Idjwi.
[<http://www.3tamis.org/templates/DOSSIERS%203TAMIS/SANTE/Idjwi/100216%20Idjwi%20rehabilitation%20hopitaux%20Kihumba%20Monvu.html>]

11. Amani Global Works: Cycle of Poverty and Disease.
[<http://amaniglobalworks.org/PROBLEM.php>]
12. Ministry of Planning and Macro International: Enquête Démographique et de Santé, République Démocratique du Congo 2007
[www.measuredhs.com/pubs/pdf/FR208/FR208.pdf]
13. Integrated Regional Information Network, Department of Human Affairs, United Nations: Zaire: IRIN Situation Report on Idjwi Island, South Kivu, 8/6/96
[www.africa.upenn.edu/Hornet/irin_8696.html]
14. Romaniuk A. Persistence of high fertility in tropical Africa: the case of the Democratic Republic of Congo. *Popul Dev Rev* 2011, 37(1): 1-28. PubMed PMID: 21714197.
15. LandScan 2001 Global Population Database [www.ornl.gov/sci/gist/]
16. Google Earth: Idjwi, South Kivu, Democratic Republic of the Congo
[www.google.com/earth]
17. Do M, Kurimoto N: Women's empowerment and choice of contraceptive methods in select Africa countries. *Int Perspect Sex Reprod Health* 2012, 38(1):23–33. PubMed PMID: 22381146.
18. Gage AJ: Sexual activity and contraceptive use: the components of the decision making process. *Stud Fam Plann* 1998, 29(2):154–166. PubMed PMID: 9664629.
19. Hung KJ, Scott J, Ricciotti HA, Johnson TR, Tsai AC: Community-level and individual-level influences of intimate partner violence on birth spacing in Sub-Saharan Africa. *Obstet Gynecol* 2012, 119(5):975–982. PubMed PMID: 22525908.
20. Bongaarts J: The causes of educational differences in fertility in Sub-Saharan Africa. In *Vienna yearbook of population research 2010*. Edited by Lutz W. Vienna: Verlag der Österreichischen Akademie der Wissenschaften; 2010:31–50.

21. Omran AR: The epidemiologic transition: a theory of the epidemiology of population change. *Milbank Mem Fund Q* 1971, 49(4):509–538. PubMed PMID: 5155251.
22. Wyon JB, Gordon JE: *The Khanna study: population problems in the rural Punjab*. Cambridge: Harvard University Press; 1971.
23. Canning D, Schutlz TP: The economic consequences of reproductive health and family planning. *Lancet* 2012, 380:165–171. PubMed PMID: 22784535.
24. Bailey MJ: More power to the pill: the impact of contraceptive freedom on women's life cycle labor supply. *Q J Econ* 2006, 121(1):259–320.
25. Ashraf N, Field E, Lee J: Household bargaining and excess fertility: an experimental study in Zambia. http://people.hbs.edu/nashraf/Excess_Fertility.pdf.
26. Berg A, Brems S: *A case for promoting breastfeeding in projects to limit fertility*. Washington DC: The World Bank; 1989.
27. Sternberg P, Hubley J: Evaluating men's involvement as a strategy in sexual and reproductive health promotion. *Health Promot Int* 2004, 19(3):389–396. PubMed ID: 15306623.
28. World Health Survey, 2002, C – Appendices (KISH Tables, Vignettes, Cards). <http://www.who.int/healthinfo/survey/whslongversionappendices.pdf>
29. Demographic and health surveys model household questionnaire. www.measuredhs.com/pubs/pdf/DHSQ5/DHS5-Household-QRE-15-Oct-2008.pdf
30. Demographic and Health Surveys Model Women's Questionnaire; www.measuredhs.com/pubs/pdf/DHSQ5/DHS5-Woman%27s-QRE-22-Aug-2008.pdf
31. World health survey instruments. www.who.int/healthinfo/survey/instruments/en/index.html
32. Macro International, Inc: *Training guidelines for DHS surveys*. Calverton; 2000.
33. Rutstein SO, Rojas G: *Guide to DHS statistics*. Calverton: ORC Macro; 2006.

34. Davis K, Blake J: Social structure and fertility: an analytic framework. *Econ Dev Cult Change* 1956, 4:211–235.
35. Stover J: Revising the proximate determinants of fertility framework: what have we learned in the past 20 years? *Stud Fam Plann* 1998, 255–267. PubMed PMID: 9789319.
36. Bongaarts J: The fertility-inhibiting effects of the intermediate fertility variables. *Stud Fam Plann* 1982, 13:179–189. PubMed PMID: 7112629.
37. Singh S, Wulf D, Hussain R, Bankole A, Sedgh G: *Abortion worldwide: a decade of uneven progress*. Washington DC: Guttmacher Institute; 2010.
38. Bongaarts J: The proximate determinants of exceptionally high fertility. *Popul Dev Rev* 1987, 13:133–139.
39. Oldenburg BF, Sallis JF, French ML, Owen N: Health promotion research and the diffusion and institutionalization of interventions. *Health Educ Res* 1999, 14:121–30. PubMed PMID: 10537941.
40. Coale AJ, Watkins SC (Eds): *The Decline of Fertility in Europe: the Revised Proceedings of a Conference on the Princeton European Fertility Project*. Princeton: Princeton University Press; 1986.
41. Bongaarts J: Completing the fertility transition in the developing world: the role of educational differences and fertility preferences. *Pop Stud-J Demog* 2003, 57:321–336. PubMed PMID: 14602532.
42. Schultz TP: Investments in women, economic development, and improvements in health, in low-income countries. *Ann N Y Acad Sci* 1989, 569:288–310. PubMed PMID: 2698095.
43. Jewkes R: Intimate partner violence: causes and prevention. *Lancet* 2002, 359(9315):1423–1429. PubMed PMID: 11978358.
44. Gender and Justice. www.healafrika.org/gender-and-justice-p-14.html

45. Mangasaryan N, Marin L, Brown A, Ogunlade A, Rudert C, Cai X: Breastfeeding promotion, support and protection: review of six country programmes. *Nutrients* 2012, 4:990–1014. PubMed PMID: 23016128.
46. Willis-Shattuck M, Bidwell P, Thomas S, Wyness L, Blaauw D, Ditlopo P: Motivation and retention of health workers in developing countries: a systematic review. *BMC Health Serv Res* 2008, 8:247. PubMed PMID: 19055827.
47. Perez F, Ba H, Dastagire SG, Altmann M: The role of community health workers in improving child health programmes in Mali. *BMC Int Health Hum Rights* 2009, 9:28. PubMed PMID: 19903349.
48. Solo J, Jacobstein R, Malema D: Repositioning family planning – Malawi case study: Choice, not chance. New York: The ACQUIRE Project/EngenderHealth; 2005.
49. Sunmola AM, Dipeolu M, Babalola S, Adebayo OD: Reproductive knowledge, sexual behavior, and contraceptive use among adolescents in Niger State of Nigeria. *Afr J Reprod Health* 2003, 7:37–46. PubMed PMID: 12816312.

TABLES

Table 1 Women's reproductive health and empowerment experiences, Idjwi, DRC, 2010

Variable	N	Weighted mean or percent	(95% CI)	Missing
Desired number of children (mean)	2078	6.1	(6.0, 6.2)	13
Age of first intercourse (mean)	2078	16.8	(16.7, 16.9)	31
Age started living with husband/partner (mean)	2078	17.7	(17.6, 17.8)	157
Months exclusively breastfed last child (mean)	2027	6.1	(5.9, 6.3)	661
Births attended by skilled health personnel (%)	2027	66.0	(63.6, 68.3)	22
Attended at least one antenatal care visit (%)	2027	84.8	(83.0, 86.6)	90
Ever used any modern contraceptive (%)	2078	6.5	(5.4, 7.6)	36
Of modern contraceptive users: Male condom	140	12.5	(6.7, 18.3)	–
Of modern contraceptive users: Pill	140	50.6	(41.5, 59.7)	–
Of modern contraceptive users: Injections	140	40.3	(31.4, 49.2)	–
Of modern contraceptive users: Other	140	10.0	(4.4, 15.6)	–
Ever used withdrawal method (%)	2078	2.5	(1.8, 3.2)	36
Ever used calendar method (%)	2078	3.7	(2.9, 4.5)	36
Unmet need for contraception (%)	2078	53.8	(53.4, 54.2)	7
Unmet need for limiting births	2078	15.5	(13.8, 17.2)	–
Unmet need for spacing births	2078	38.3	(36.1, 40.5)	–
Women in polygynous marriage (%)	2078	14.6	(13.8, 17.2)	154
Self-reported literacy (%)	2078	37.8	(35.5, 40.1)	20
Health worker spoke to respondent about family planning in the last year (%)	2078	14.2	(12.9, 16.3)	9
Respondent's health care decisions are made by ____ (%)				147
Herself	2078	6.9	(5.7, 8.1)	–
Husband/partner	2078	85.2	(83.5, 86.9)	–
Herself and husband/partner	2078	7.0	(5.8, 8.2)	–
Someone else	2078	0.9	(0.4, 1.3)	–
Respondent believes it is "common" or "very common" for a woman in her community to be...				
Beaten by her husband/partner	2078	52.3	(50.0, 54.7)	11
Verbally threatened by her husband/partner	2078	48.1	(45.8, 50.5)	12
Forced by her husband/partner to have sex	2078	39.4	(37.1, 41.7)	17
Forced by someone other than her husband/partner to have sex	2078	35.6	(33.4, 37.9)	19
Respondent believes a husband is justified to beat wife if...				
She goes out without telling him	2078	80.4	(78.5, 82.3)	31
She neglects the children	2078	76.0	(74.0, 78.0)	33
She argues with him	2078	68.3	(66.1, 70.5)	36
She refuses to have sex with him	2078	69.9	(67.7, 72.1)	36
She burns the food	2078	57.8	(55.5, 60.1)	35

Table 2 Household characteristics, Idjwi, DRC, 2010

Variable	Weighted mean or percent	(95% CI)	Missing
Monthly Household Income in USD (mean)*	\$60.97	(\$43.51, \$78.43)	888
Lowest Quintile	\$0.18	(\$0.14, \$0.22)	–
2 nd Lowest Quintile	\$2.07	(\$1.93, \$2.21)	–
Middle Quintile	\$7.30	(\$7.03, \$7.57)	–
2 nd Highest Quintile	\$17.30	(\$16.32, \$18.28)	–
Highest Quintile	\$293.25	(\$206.91, \$379.59)	–
Household Nutrition in last year (%)			33
Enough to eat, and kinds of food we want	14.6	(13.0, 16.1)	–
Enough to eat, NOT kinds of food we want	26.4	(24.4, 28.3)	–
Sometimes don't have enough/anything to eat	32.1	(30.0, 34.2)	–
Often don't have enough/anything to eat	25.9	(23.9, 27.9)	–

N=2078.

* Households that trade more goods than hard currency might appear poorer in this table than they actually are.

Table 3 Preferred method of contraception

Type	Weighted percent	(95% CI)
Injection	26.5	(24.4, 28.5)
Pill	25.4	(23.3, 27.4)
Don't want to use	20.4	(18.5, 22.4)
Other	9.9	(8.5, 11.5)
Spermicide (foam/jelly)	6.1	(5.0, 7.2)
Don't know	4.9	(3.8, 6.0)
IUD	3.4	(2.5, 4.2)
Withdrawal	3.3	(2.4, 4.3)

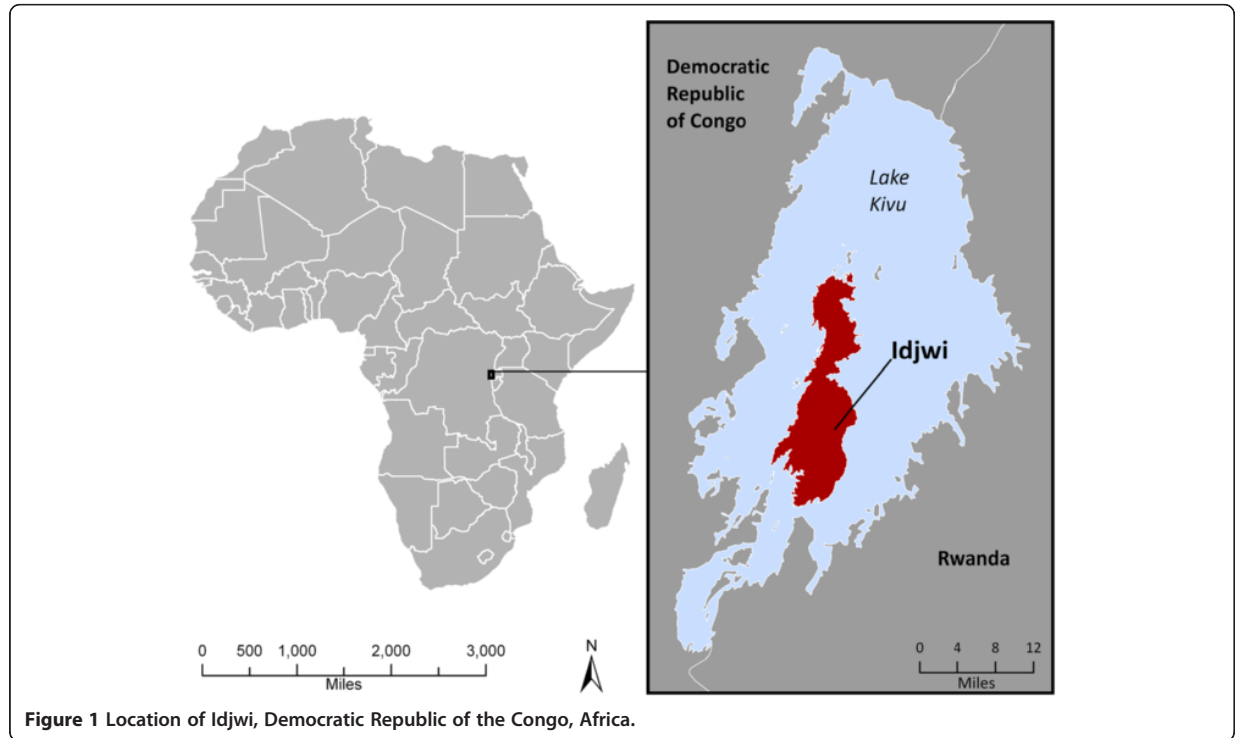
N=2078, missing=57.

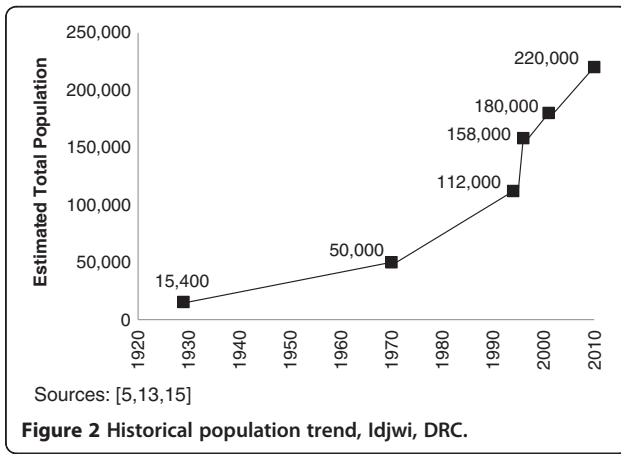
Table 4 Reasons women with unmet need do not use contraception

Reason	Weighted percent	(95% CI)
Breastfeeding/postpartum amenorrhea	21.7	(18.8, 24.6)
Costs too much	20.5	(17.6, 23.4)
Knows no source	18.9	(16.1, 21.6)
Knows no method	18.3	(15.5, 21.0)
Husband opposed	15.9	(13.3, 18.5)
Health concern/fear side effect	15.6	(13.0, 18.1)
Fatalistic	14.0	(11.6, 16.4)
Interferes with body's processes	7.2	(5.5, 8.9)
No sex/infrequent sex	7.1	(5.3, 8.8)
Lack of access/too far	5.1	(3.4, 6.6)
Menopausal/infecund	4.8	(3.1, 6.4)
Inconvenient to use	4.4	(3.0, 5.7)
Religious prohibition	2.5	(1.4, 3.5)
Other	2.3	(1.2, 3.4)
Not married	2.0	(0.9, 3.0)
Others opposed	1.2	(0.3, 2.0)
Respondent opposed	1.1	(0.4, 1.7)
Don't know	0.1	(<0.1, 0.3)

N=1140, missing=260.

FIGURES





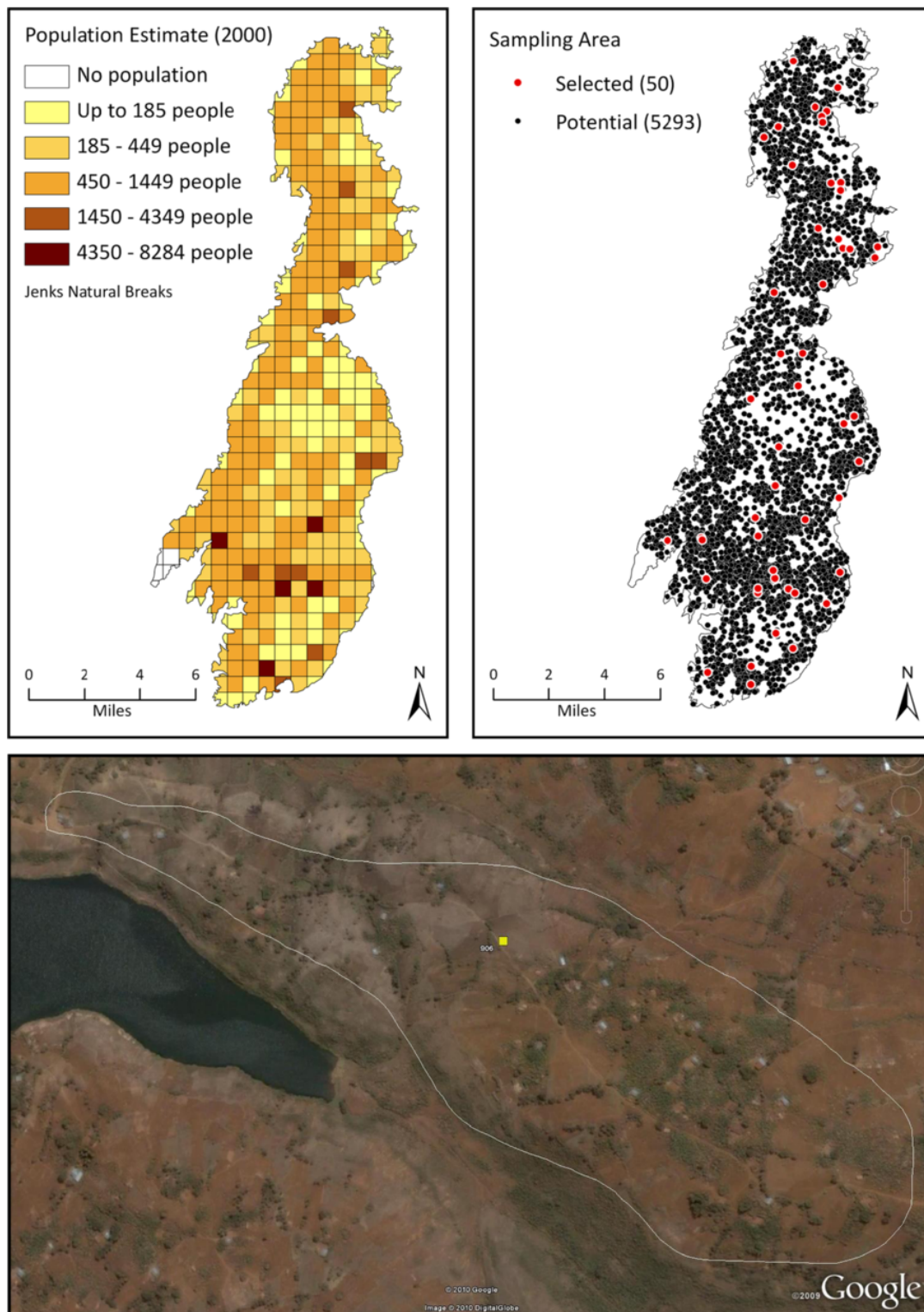


Figure 3 Cluster sampling approach. (Top left) LandScan population grid. (Top right) Coordinates placed in proportion to population density, and 50 coordinates randomly selected. (Bottom) Example of sampling area delineated around the ~ 45 closest dwellings to a selected coordinate in satellite imagery.

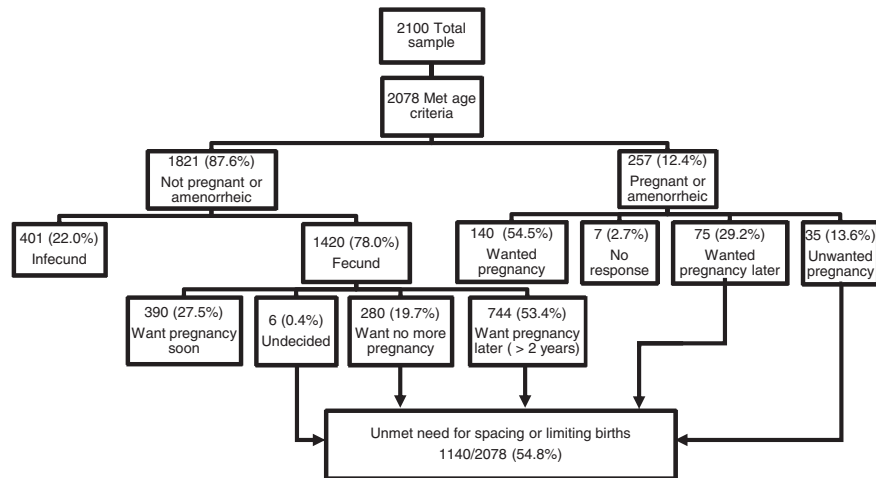


Figure 4 Schematic of fertility desires and unmet need for contraception, Idjwi, DRC, 2010.

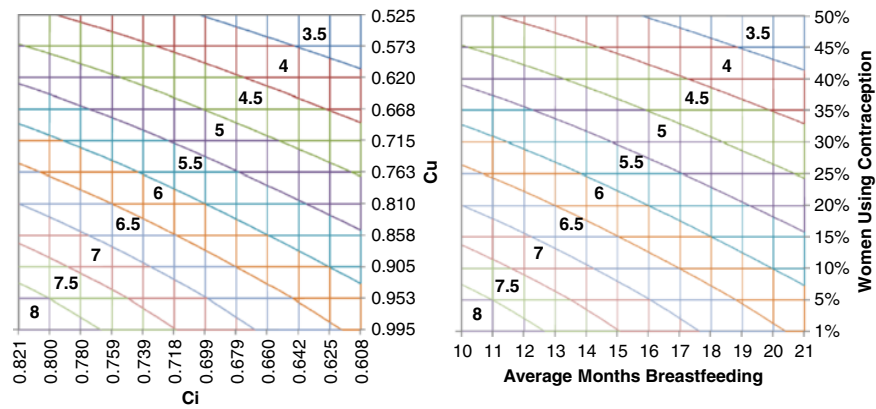


Figure 5 Expected fertility rate under scenarios of contraceptive prevalence and breastfeeding. Both figures show the relationship between contraceptive prevalence, average length of breastfeeding, and fertility. The left figure show these relationships in terms of fertility indices; the right figure shows these relationships in terms of prevalence. Values in the color bands correspond with different levels of TFR. Currently, Idjwi is positioned in the bottom left corner with 8.3 TFR, an estimated 1% contraceptive prevalence ($Cu=0.991$), and average length of total breastfeeding 10.4 months ($Ci=0.812$). If an interim goal is to reduce TFR to 6 births per woman, this figure outlines a range of scenarios to achieve that goal including increasing contraceptive prevalence to 30% ($Cu=0.715$), extending average length of breastfeeding to 21 months ($Ci=0.608$), or some combination of both such as extending average length of breastfeeding to 15 months ($Ci=0.718$) and providing contraception to 20% ($Cu=0.810$) of the Island's sexually active fecund women.

IMPACT SINCE PUBLICATION

This thesis constitutes the first of several upcoming publications about health conditions on Idjwi Island. Publication of this thesis has illuminated poor maternal health conditions on Idjwi for UN organizations and NGOs working in the Kivu basin. We subsequently consulted with several NGOs to institute new programming on Idjwi. Cordaid is now supplying contraceptive methods at Idjwi's health clinics, and HEAL Africa has begun a \$250,000 effort to train skilled birth attendants on Idjwi.

PREVIOUS GRADUATE THESIS

For my MPH at HSPH I submitted the preliminary results of our team's household survey of Idjwi Island (abstract below). After matriculating at HMS, I returned to Idjwi to perform focus groups and key informant interviews. I integrated this ethnographic work with our previous survey results to form a comprehensive assessment of Idjwi's health conditions, which is used by NGOs and UN organizations in the Kivu Basin (report available separately). We are now working to publish our findings, one topic at a time, with recommendations for effective and acceptable interventions. This thesis presents our findings on women's health, and models several community-supported interventions.

Abstract for HSPH thesis: Located in Lake Kivu in eastern Democratic Republic of Congo (DRC), Idjwi Island is largely overlooked by development organizations operating in the region. At the invitation of Idjwi's political leaders, our team performed the first, broad, representative assessment of health conditions facing the island's population of approximately 220,000. Following standard practices for survey design and implementation, we surveyed 2100 households in 50 enumeration areas distributed at random throughout populated areas. We found that health and economic conditions on Idjwi are often worse than the DRC as a whole. Fertility and mortality are both extremely high. Hunger and infectious disease are rampant, particularly among children. And women experience severe disempowerment, violence, and lack of reproductive health services. This report provides a detailed descriptive account of our results.

APPENDIX

PATTERNS OF POVERTY AND DISEASE AMONG THE BANY'IDJWI: AN EXPLORATORY ASSESSMENT OF IDJWI ISLAND, DRC

Michael B. Hadley, MPH

In partnership with:
World Vision International
Harvard Medical School

Summer 2012

AFFIRMATION

This assessment was performed with the invitation and participation of community leaders and incorporated extensive community input via town hall meetings, focus groups, and hiring of local men and women. Except as acknowledged by the references in this report, the assessment process, findings, interpretations, conclusions, and recommendations consist of our own work. We declare that we have no conflicts of interest.

ACKNOWLEDGEMENTS

We would like to convey our deepest gratitude to the people of Idjwi for working with us to build an understanding of local issues. We hope that the findings reported here will prove useful for community initiatives and development organizations. Additional thanks go out to Dr. Barthelemy Aksanti, Dana Thomson, Thomas McHale, Marcia Castro, Allan Hill, Joshua Salomon, Leah Shearman, Constance Smith, and Dominic Keyzer, whose support and guidance made this report possible.

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GLOSSARY

Acronyms

AIDS	Acquired immune Deficiency Syndrome
BXW	Banana Xanthomonas Wilt (also known as Banana bacterial wilt)
CNDP	National Congress for the Defence of the People
DHS	Demographic & Health Surveys (MEASURE DHS)
DPT	Diphtheria, Pertussis and Tetanus
EDRC	Eastern Democratic Republic of Congo
FGD	Focus Group Discussion
IDP	Internally Displaced Person
IPV	Intimate Partner Violence
ITN	Insecticide treated Nets
LEAP	Learning through Evaluation Assessment and Planning
MONUSCO	UN Organization Stabilization Mission in the Democratic Republic of the Congo
NGO	Non Governmental Organization
ORS/RHS	Oral Rehydration Solution/Salts
PPP	Purchase Power Parity
SGBV	Sexual- and Gender-based Violence
UN	United Nations
US\$	United States Dollar
VCT	Voluntary Counseling and Testing
WASH	Water, Sanitation, and Hygiene
WV eDRC	World Vision Regional office/program in Eastern DRC

EXECUTIVE SUMMARY

Overall, conditions on Idjwi are worse than those in the DRC as a whole. The people of Idjwi are extremely poor—average household income reaches only about US\$1 per day. Although most locals are subsistence farmers, less than a third of households own their own land. 15 percent of people have nowhere to go for health care, the most common limiting factors being cost and distance to an open facility.

Infectious diseases are rampant. Nearly all respondents have had malaria, and a third are unaware that mosquitoes are the vector. Half of respondents have had an oral infection at some point in their lives. One third of children have not been vaccinated against common diseases. Over a third of children had diarrhea in the two weeks prior to the survey, often with blood in their stools, and only 28 percent of diarrhea cases were given ORS/RHS. Gastrointestinal illnesses are likely a result of restricted access to clean water and sanitation. The prevalence of HIV is estimated to be 3-5%.

Women on Idjwi experience severe disempowerment and violence. Half as many women as men attend primary school, and nearly half of women report being completely illiterate. The majority of women marry before age 19 to a man at least 6 years her senior. Married men frequently have multiple sexual partners and sometimes multiple wives. The husband usually makes decisions about how to spend household income and what sorts of health care his wife receives. A third of women report that extramarital rape is common in their community. Also, wife beating has become the norm in the majority of communities. Indeed, most women believe that wife beating is usually justified.

There is no credible justice system on Idjwi. Traditional tribunals discriminate against women, Batwa (pygmies), poor, and uneducated. It is nearly impossible for a woman to seek justice against her husband. Even convicted perpetrators can easily escape from deteriorating prisons and corrupt police.

Women are most concerned about illnesses related to reproduction. Most women will have their first child before age 18. Also, birth intervals are less than two years for the majority of pregnancies. Only one quarter of women receive four or more antenatal care visits for their last pregnancy. One third of deliveries receive no assistance from trained personnel. Slightly more than half of women have unmet need for contraception. As a result of these various factors, total fertility on Idjwi is over eight children per women.

Fertility and mortality are both very high on Idjwi, suggesting that the island has not yet entered the demographic transition¹. Mortality is more than twice as high on Idjwi compared to the DRC as a whole. Deaths among adults are often painful, involving symptoms of nausea, diarrhea, constipation, or coughing. Simultaneously, high fertility fuels overpopulation and environmental destruction.

Hunger and malnutrition have increased with a catastrophic banana and cassava epidemic. Additionally, the amount of arable land per head has decreased with rising population and poor agricultural techniques. More than half of households report that they sometimes do not have enough to eat, and half of children receive no more than one meal per day. Due to the current food crisis, the average household on Idjwi is getting poorer and in the coming year a large number of children are expected to drop out of school. As the crisis worsens, Idjwi is in desperate need of NGO assistance with food, water, health, education, protection, and justice.

¹ Sunmola, A.M., M. Dipeolu, S. Babalola, O.D. Adebayo. 2003. Reproductive knowledge, sexual behavior, and

1. INTRODUCTION

1.1. Exploratory Assessment of Idjwi Island

1.1.1. Objectives. This assessment explores the following issues as they pertain to Idjwi:

- a) Main issues according to the community
- b) Population and demographics
- c) Geography, ecology, and conservation
- d) Political, economic, civic, and religious institutions and stakeholders
- e) Poverty, education, employment, livelihood strategies and limitations
- f) Water, sanitation, and hygiene practices and limitations
- g) Food production, utilization, and nutrition
- h) Access to acceptable, quality, affordable health care and preventive medicine
- i) Common infectious diseases, including HIV/AIDS, sexually-transmitted infections, malaria, tuberculosis, gastrointestinal illnesses, respiratory infections, and oral diseases.
- j) Maternal and child morbidity and mortality
- k) Social values
- l) Agency, empowerment, inequality, and vulnerable subpopulations
- m) Knowledge, enjoyment, and violations of basic rights
- n) Security, protection, and justice, including child abuse and violence against women
- o) Logistic considerations for potential programs
- p) Analysis of sponsorship feasibility and risk management
- q) Program recommendations

1.1.2. Research Methods & Limitations. This assessment combines research from the following sources. All respondents gave informed consent and were free to end the interview at any time.

- a) **Household survey** (2010): Researchers from Harvard University surveyed 2100 households using a one-stage sample. The survey tool included a household roster, pregnancy history, and over 300 questions from the Demographic and Health Survey² (DHS) Household Survey and Women's Module, which were translated into Ki'Havu and field-tested. 68 local women were trained to interview other local women according to DHS guidelines. This data is representative of all households on Idjwi containing at least one woman age 18-50. Since some households are headed by women under age 18, and since adolescent women are associated with greater maternal and child health risks, maternal and child health on Idjwi may be even worse than that reported here.
- b) **Key informant interviews** (2011 & 2012): Researchers from Harvard University partnering with WVDRC interviewed key stakeholders from government, business, health care, education, civic, and religious institutions. This research employed snowball sampling, interview recording and coding, and ethnographic methods for data analysis. Contact information for a selection of these key informants can be found in the "Community Contacts" section.
- c) **Interviews with respondents from vulnerable subpopulations** (2011 & 2012): Researchers from Harvard University partnering with WVDRC conducted thirty

² MEASURE DHS (2010). <http://www.measuredhs.com>.

interviews with abused women, Batwa, and geographically isolated groups. This research employed snowball sampling, interview recording and coding, and ethnographic methods for data analysis.

- d) **Focus group discussions** (2011 & 2012): Researchers from Harvard University partnering with WVDRC conducted thirty focus groups with men and women in ten villages across Idjwi. This research employed snowball sampling and made use of World Vision's Focus Group Discussion Tool, Rights Awareness Worksheet, and Pair-Wise Ranking.
- e) **Town hall meetings** (2010): Researchers from Harvard University held town hall meetings in Bugarula and Kashofu, the political centers of North and South Idjwi, respectively.
- f) **Observation** (2010 & 2011): Researchers from Harvard University performed geospatial and structural analysis of local infrastructure. This report makes use of maps and photographs from this research.
- g) **Additional sources**: When possible, this report makes use of data collected by other researchers and organizations. In particular, we use data from the Catholic Organization for Relief and Development Aid (CORDAID), Amani Global Works, and the Catholic University of Bukavu.

In this document, all uncited findings are results from Harvard University research (a-f above), which may be cited as: "Hadley, M, D Thomson, T McHale (2012). *Key Findings of the Idjwi Island Needs Assessment 2010-12*. Harvard Humanitarian Initiative."

1.2. The Democratic Republic of the Congo

1.2.1. National context. The Democratic Republic of the Congo (DRC) is located in central Africa. The country is the second largest on the continent, with an area of 2,345,409 square kilometres³. It is also the fourth most populous nation in Africa, with nearly 72 million residents in 2011⁴. The country is home to over 400 ethnic groups, including approximately 600,000 Pygmies, the region's aboriginal people⁵. The major languages are French, Swahili, Lingala, Kongo, and Tshiluba. The vast majority of the population (96%) are of Christian faith; 1.5% of the population is Muslim⁶.

The country is home to vast natural resources, including over 70% of the world's coltan and cobalt, valued in excess of US\$24 trillion⁷. The DRC also possesses 50 percent of Africa's forests and a river system that could provide hydro-electric power to the entire continent. However, national output has fallen significantly since the 1980s under the government of Mobutu Sese Seko, and subsequently following the Rwandan genocide, First and Second Congo Wars. The Second Congo War (1998-2003) was the world's deadliest conflict since WWII, killing 5.4 million people⁸. Rwanda bears significant responsibility for these conflicts, having invaded Congo multiple times. Fighting continues in the east and often centers on control of mineral deposits. Over 200,000 women have been raped by militias and many communities see

³ US Central Intelligence Agency (2011). *The World Factbook*: "Congo, Democratic Republic of the." Langley, VA.

⁴ US Central Intelligence Agency (2011). *The World Factbook*: "Congo, Democratic Republic of the." Langley, VA.

⁵ Associated Press (2003). *Pygmies want UN tribunal to address cannibalism*.

⁶ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁷ News about Congo (2009). *Congo with \$24 Trillion in Mineral Wealth BUT still Poor*.

⁸ Robinson, S (2006). *The deadliest war in the world*. Time Magazine.

violence as normal⁹. Instability has perpetuated corruption, inflation, poor legal frameworks, and lack of foreign investment.

Today, the DRC is the world's poorest country, with a GDP of only US\$300-350 per capita¹⁰¹¹¹². The DRC also ranks last among all countries on the Human Development Index¹³. Sexual violence in the DRC is often described as the worst in the world¹⁴. Displacement, disease, and famine continue to kill thousands every month¹⁵. Still, the response of the international community has been incommensurate with the scale of the disaster¹⁶.

1.2.2. World Vision in Eastern DRC (EDRC)¹⁷. World Vision has provided humanitarian aid in EDRC since the Rwandan genocide in 1994. In 2002, WVDRC provided humanitarian aid following a volcanic eruption at Goma, and has continued with other interventions in the regions. Currently, WVDRC runs HEA operations serving approximately 400,000 children in EDRC. Programming includes WASH, health care, nutrition, food security, and protection and support of vulnerable women and children. [Leah will add more]

1.3. Idjwi Island.

1.3.1. Background on Idjwi. Idjwi rests in Lake Kivu along the border between the DRC and Rwanda at the highest segment of the western Rift Valley. The narrow island stretches 40 kilometers down the center of Lake Kivu to cover an estimated 320 square kilometers. The climate provides a long and reliable growing season for a variety of crops, but increasing population and deforestation are quickly decreasing the amount of arable land per capita.

Idjwi is home to approximately 230,000 Havu people, the majority of whom live in a subsistence agricultural tradition disconnected from the industrialized cities on the mainland. Additionally, the island is home to approximately 7,000 Batwa or Barhwa (Pygmies), the indigenous people of the Lake Kivu basin. The Batwa are a severely oppressed minority on Idjwi, without rights to land, fishing, or hunting. The island has been free from conflict since the repatriation of refugees following the Rwandan genocide.

Idjwi is a single Health Zone and a Territory of South Kivu Province in the DRC. The island is divided into northern and southern administrative districts: the Rubenga and Nkambusa Chiefferies, each with their own king (“*mwami*”) and respective political centers at the villages of Bugarula and Kashofu. Allegiances are increasingly formed with external institutions, such as the Catholic Church, which operates schools and health centers across the island¹⁸.

Some organizations presume that Idjwi's freedom from conflict shelters it from serious humanitarian needs. This report argues otherwise. Because of Idjwi's geographic, economic, and sociopolitical isolation, conditions on the island often are far worse than those in rural, mainland EDRC.

⁹ Cochrane, Kira (2008). *The victims' witness*. The Guardian.

¹⁰ International Monetary Fund. World Economic Outlook Database (2012).

¹¹ World Bank. World Development Indicators Database (2012).

¹² US Central Intelligence Agency (2011). *The World Factbook: "Congo, Democratic Republic of the."* Langley, VA.

¹³ United Nations Development Program (2011). *Human Development Report 2011*.

¹⁴ McCrummen, S (2007). *Prevalence of Rape in E. Congo Described as Worst in World*. Washington Post.

¹⁵ Kristof, ND (2010). *Orphaned, Raped, and Ignored*. New York Times.

¹⁶ Human Rights Watch (2010). *War Crims in Kisangani*.

¹⁷ Kithaka, P (2011). *Comprehensive Assessment Report for Rwanguba Health Zone, Rutshuru Territory – North Kivu Province of the DRC*. World Vision DRC.

¹⁸ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

1.3.2. World Vision's experience on Idjwi. WVDRC has provided Idjwi with some assistance in the past, including donation of mosquito nets and pharmaceutical supplies. Currently, however, WVDRC operates no programs on Idjwi. [Leah will add more]

2. CONTEXT & KEY STAKEHOLDERS

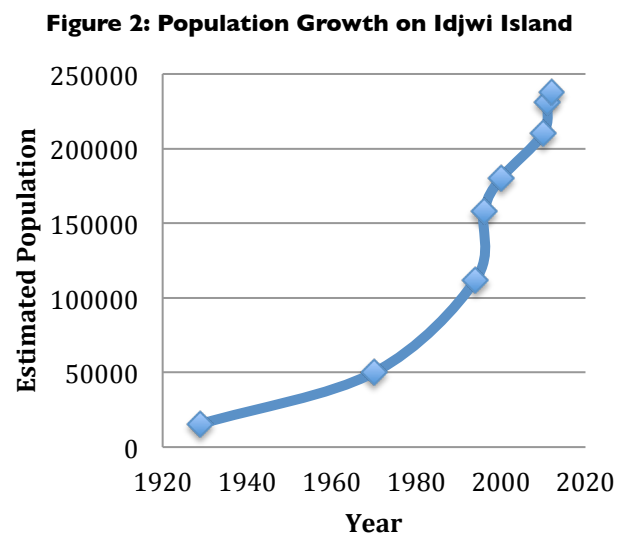
2.1. Demographics, Population, Migration

Demographics. Idjwi is home to approximately 220,000 Havu people, the majority of whom live in a subsistence agricultural tradition disconnected from the industrialized cities on the mainland. The Havu people are located on the Western shores and islands of Lake Kivu. They share a common heritage through the Ki'Havu language, union under the Basibula royal dynasty, and orientation towards the lake for communication and livelihood¹⁹.

Additionally, the island is home to approximately 6,500 Batwa or Barhwa (Pygmies), the indigenous people of the Lake Kivu basin. The Batwa are a severely oppressed minority on Idjwi, without rights to land, fishing, or hunting. To many residents, they are viewed as creatures, rather than full people. Forced to move from place to place, the Batwa live in makeshift shelters and rely on pottery as their principal source of income²⁰.

Residents of Idjwi identify themselves as Congolese, but also as “Bany’Idjwi,” meaning “people of Idjwi.” Virtually all residents prefer to speak Ki'Havu in their household, and many know no other language. Kiswahili is spoken among men and used for economic transactions with the mainland. French is taught in schools and spoken by many of the island’s elite.

Population density & growth. Idjwi’s fertile volcanic soil and regular rainfall supported a population growth rate ranging from 2.9% to 3.3% between 1929 and 1994²¹. During the 1994 Rwandan Genocide, Idjwi’s population swelled by 41% in the span of a few months when 46,000 Rwandan refugees, mostly women and children, fled to the island²². Many Congolese also have moved to Idjwi to distance themselves from the recent conflict on the mainland. In 2001, LandScan population estimates put Idjwi’s population just under 180,000²³. In 2011 and 2012, local health centers estimated the population to be 231,1000 and 238,000, respectively. This suggests a current 3.0% annual rate of population growth (compared to 2.6% in DRC overall²⁴) and population density of 750 per km sq (compared to just 32 per km sq in DRC overall²⁵). Figures 2 and 3 illustrate Idjwi’s population growth and distribution across the island. Villages



¹⁹ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

²⁰ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

²¹ Caraël M, Stanbury JB: Promotion of birth spacing in Idjwi Island, Zaire. *Stud Family Plann* 1983, 14:134-142.

²² Integrated Regional Information Network, Department of Human Affairs, United Nations: Zaire: IRIN Situation Report on Idjwi Island, South Kivu, 8/6/96 [www.africa.upenn.edu/Hornet/irin_8696.html]

²³ LandScan 2001 Global Population Database [www.ornl.gov/sci/gist]

²⁴ CIA World Fact Book (2011). <https://www.cia.gov/library/publications/the-world-factbook/>

²⁵ CIA World Fact Book (2011). <https://www.cia.gov/library/publications/the-world-factbook/>

range in size from 100s to 1000s. Most of the population is clusters along the western shore, which is served by boats and Idjwi's main road.

Idjwi's population growth is due primarily to high fertility. Median age is 12 years, and 55 percent of the population are younger than 15. Idjwi has a younger population than the DRC, where the median age is 17.4 years. Only 5.7 percent of individuals are above age 40, suggesting a short life expectancy.

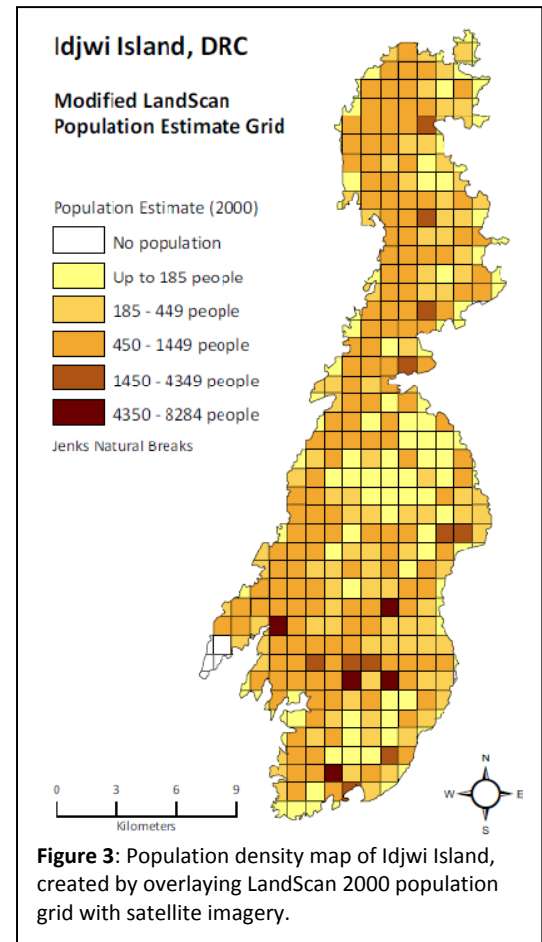
Migration. 97.5 percent of respondents reported being born on Idjwi, 1.5 percent were born elsewhere in the DRC, and 1 percent were born in Rwanda. The net rate of emigration from Idjwi is approximately 0.6% (calculated as crude rate of increase minus population growth rate)²⁶. The 2012 rate of emigration is expected to be *higher* due to poverty and hunger resulting from the current banana and cassava epidemics. Large numbers of young men and women seek education and employment opportunities on the mainland, while children and elderly people remain on the Island. This results in a chronic workforce shortage.

There is minimal migration within the island, except for some adolescents who migrate from North to South during the dry season in search of food and fertile soil.

Typical household. The household is formed around the nuclear family. On average households on Idjwi are made up of 5.2 people. 15 percent are made up of seven or more people. 6.7 percent of households had no adult men, and in the majority of these a woman had take on the role of head of household.

2.2. Geography & Ecology

Geography. Idjwi Island rests in Lake Kivu along the border between Rwanda and the DRC. Lake Kivu, one of the African Great Lakes, stretches for 55 miles along the highest segment of the western Rift Valley. The lake lies nearly 5,000 feet above sea level, and is surrounded by mountains over 10,000 feet tall, which descend precipitously to the waterfront. Reaching depths over 1,500 feet, the lake stores an estimated 60 cubic miles of carbon dioxide and 15 cubic miles of methane, resulting from interactions between the lake and nearby volcanoes. A limnic eruption of these gas deposits would be the largest in recorded history and threaten the lives of the 2 million people living in the lake basin²⁷.



²⁶ The DRC's total urbanization rate was 0.7% across 2000-2010. UNHABITAT, 2007.

²⁷ Nayar, Anjali. *A lakeful of trouble*. Nature (2009); 460: 321-323.

Idjwi is the world's tenth largest inland island, stretching 40 kilometers down the center of Lake Kivu to cover an estimated 320 square kilometers. Idjwi's Northern and Southern districts are divided by an East-West line that passes through Nyamusisi, the island's highest mountain. Idjwi North is roughly 130 km sq, while Idjwi South is roughly 190 sq km. Only 3 kilometers wide in places, the island has a long shoreline relative to its area. This fact, coupled with the island's rugged mountains, makes boat a frequent method of transportation²⁸.



View across part of North Idjwi

Idjwi suffered extensive deforestation in the mid 1990s when refugees from Rwanda fled to the island. The island's tallest mountain, once densely forested, has been almost completely cleared of trees. Population pressure has led to continued deforestation and misuse of soil, which together have led to erosion and shrinking arable land.

Climate & ecology. Idjwi's climate provides two dry seasons from December to January and from June to September, with July and August mostly devoid of precipitation²⁹. Average temperature is approximately 18°C and annual rainfall is approximately 140cm (See Figure below)³⁰. The climate provides a longer and more reliable growing season than that on the mainland, and a variety of crops are grown over several cropping seasons³¹. Once densely forested, the island is home to little endemic vegetation, having been replaced by crops or cut down to make charcoal and building materials. Cassava and banana are grown primarily in the North, and pineapples are grown primarily in the South.

Estimated monthly rainfall on Idjwi (140cm annually)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
8	10	12	14	20	8	2	4	20	20	14	8

2.3. Economy. Idjwi's distance from major markets has deterred significant industrial development³². We estimate Idjwi's total annual "GDP" to be US\$20 Million, or approximately \$400³³ of hard cash income per average household per year (unadjusted). This economy revolves around agriculture/livestock (47%), commerce (38%), mining (9%), and fishing (6%). Major

²⁸ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

²⁹ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

³⁰ Caraël M, Stanbury JB: Promotion of birth spacing in Idjwi Island, Zaire. *Stud Family Plann* 1983, 14:134-142.

³¹ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

³² Caraël M, Stanbury JB: Promotion of birth spacing in Idjwi Island, Zaire. *Stud Family Plann* 1983, 14:134-142.

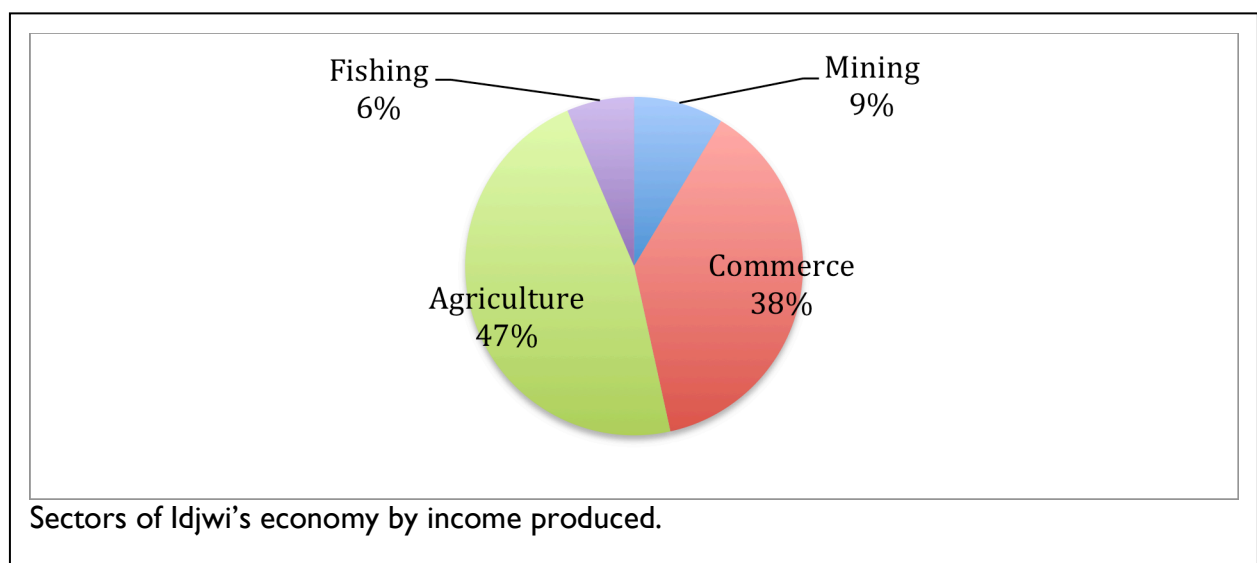
³³ This is an updated figure. The previous figure was incorrectly adjusted for income distribution.

crops include banana, cassava, coffee, and pineapple, which are often sold to merchants from Bukavu, Goma, and Rwanda. Common livestock include cows, goats, chickens, and turkeys. Commerce includes clothes, roofing, baskets, pottery, large canoes, fishing equipment, and shipping services around the lake. Fishermen catch small “sambaza,” which are eaten on Idjwi and sold on the mainland. Currently, there is only artisanal mining on Idjwi – no major industrial operation exists.

The North and South have somewhat different economies. The North has more fertile soil and focuses largely on banana and cassava subsistence agriculture. In the South, the economy revolves around pineapples and commerce. Consequently, the average household in the North is poorer but less likely to suffer from food shortages than the average household in the South.

Most farmers are independent and have no negotiating power with mainland merchants. However, 2000 coffee farmers recently formed a cooperative under the leadership of Gilbert Makelele (contact information above). Through this cooperative, farmers are selling coffee at five times the previous price. This cooperative also provides farmers with credit for health care and education and is a developing force on Idjwi.

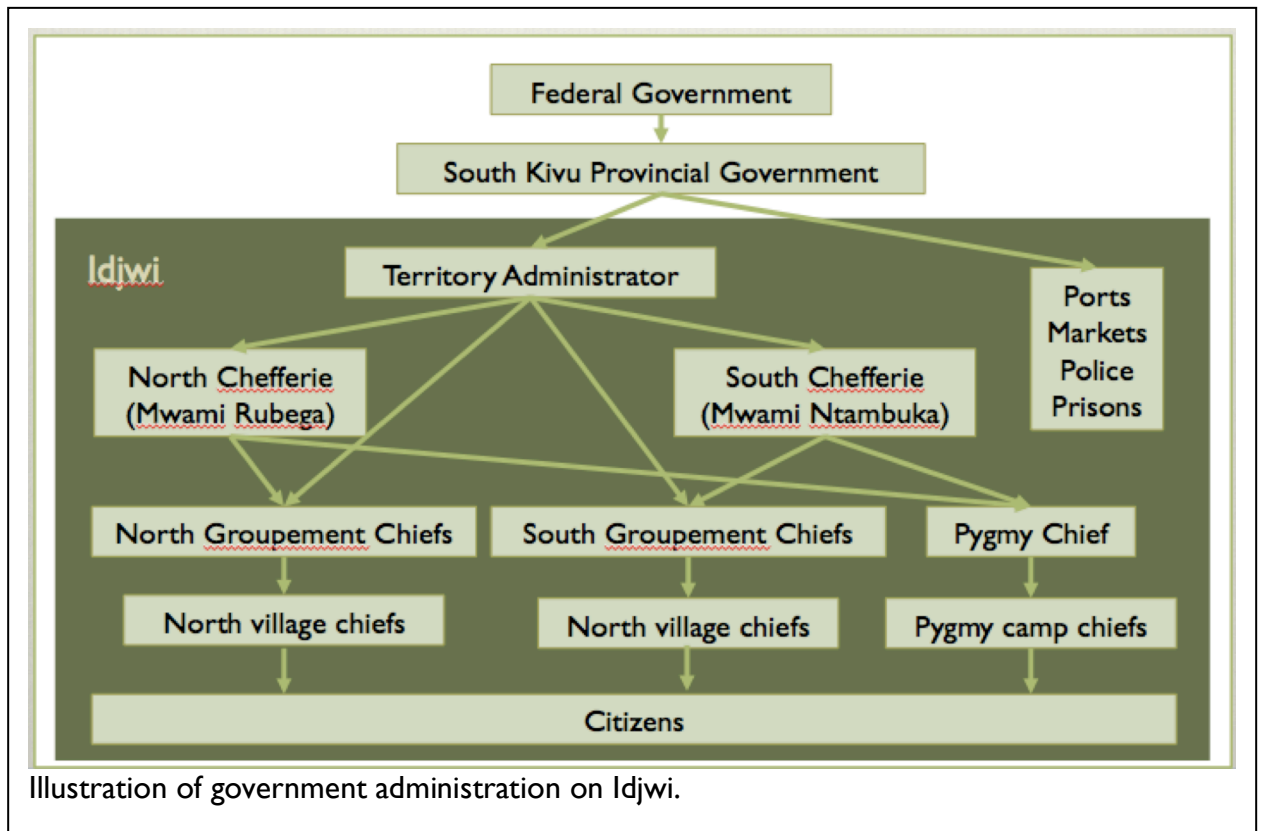
Many stakeholders cite isolation as a key cause for Idjwi’s underdevelopment. First, isolation provides corrupt authorities, such as kings and police, with a haven from accountability. Second, all trade with the mainland must be conducted by boats, which carry less than land vehicles and provide substantially greater risks. Because of these risks, only a few mainland merchants do business on Idjwi. Because of an absence of competition, these merchants are able to buy Idjwi’s goods at very low prices and sell their own prices at exorbitant prices. Idjwi also suffers from a drain of capable working-age men and women, who travel to Goma and Bukavu for education and employment opportunities. As a result, Idjwi has an insufficient workforce to support its growing population of children and elderly. Both government and religious leaders also feel that Idjwi is isolated from the spread of ideas and social progress. Finally, Idjwi is relatively isolated from that international development community – currently, no international NGO has an office on Idjwi.



2.4. Political Context & Stakeholders (See Figure below). Idjwi is a single Health Zone and a Territory of South Kivu Province in the DRC. The territory is administered by the Territory Administrator in Bugarula, appointed by the Congolese Government. The Administrator has two

main assistants, one for social affairs and another for finance³⁴. The provincial government continues to administer local ports, prisons, and markets, but its authority over the people of Idjwi remains somewhat superficial³⁵. Idjwi sends only one representative, Burcha Kuliri, to the provincial parliament, and no representatives to Kinshasa.

The island is then divided into northern and southern administrative districts: the Rubenga and Nkambusa Collectives, each with their own king (“*mwami*”) and respective political centers at the villages of Bugarula and Kashofu. This administrative split is the result of colonial rule and an enduring cleavage within the royal family³⁶. The king (or *mwami*) of the south retains more ritual status and traditional importance, while the king of the north is more closely affiliated with the federal government and somewhat less influential. Increasingly, kingship has shifted from ritual significance towards administrative functions³⁷. Both kings now have influence in regional and national political circles.



Each Collective has three Groupements, such that the island has a total of six Groupements. Each Groupement is led by a Chief nominated by the Territory Administrator in consult with the appropriate King³⁸. The Chief leads the Groupement and reports to the respective King and Territory Administrator. Each Groupement is then divided into villages and neighborhoods, each with their own Chief, who reports to the Groupement Chief. Idjwi is also scattered with camps of Batwa (pygmy), which report to a single Chief named by the King. This

³⁴ Sebisaho, J (2009). *Initial Assessment of Idjwi Island*. Amani Global Works.

³⁵ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

³⁶ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

³⁷ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

³⁸ Sebisaho, J (2009). *Initial Assessment of Idjwi Island*. Amani Global Works.

Batwa chief has symbolic significance but is subject to ethnic discrimination and wields little administrative power.

The kings on Idjwi have nearly unchecked power. They own nearly half of the land on Idjwi. When questioned about this unequal distribution of wealth, the King of the North cited the Congolese Constitution, stating “the land belongs to the people and their traditional chief.” The kings loan their land to farmers and expect to be paid with *half* of the annual crops. Families owning their own land are charged an annual tax of \$10-18, which many find extremely burdensome. The kings also feel little accountability. Although they report to the Territory Administrator, they also use tax revenues to pay his salary. Additionally, reports of suspicious activity by the Administrator to the Provincial government typically go unanswered. The kings also maintain a monopoly on justice. Idjwi has no official court system, only traditional tribunals. The kings lead these tribunals, which they acknowledge presents a conflict between judicial and executive responsibilities.

People are tired of these politics and a quiet revolution is stirring. A group of Idjwi’s most influential civic leaders—the Idjwi Rights Defenders—have formed to promote greater equality, justice, and representation. Well-organized and well-educated, they are meeting with communities across the island to discuss political change. Some leaders suggested that in one or two years the island would be ready to rise up together and demand change from the kings. They are currently looking for NGOs to support their operation with funding, transportation, and communications technology.

2.5. Social & Religious Context

Cultural crossroads. For many generations, Idjwi has been at a cultural crossroads for groups living around the lake³⁹. Certain parts of the island have strong ties to certain communities in Rwanda or DRC. These ties come with their own cultural, political, and economic meanings. For many families, relatives moved to Idjwi to grow specific crops. Today, those food crops are still traded with connected communities on the mainland, along with cattle, goats, and banana wine⁴⁰.

Religious organizations. As described by Newbury, religion plays an organizing role in Idjwi’s social structures and norms⁴¹. Rather than identifying with a local political or economic group, most Bany’Idjwi form allegiances with external institutions, such as the Catholic Church, which operates schools and health centers across the island⁴². 50% of the population identifies as Catholic, 41% as Protestant, 2% as Muslim, and 7% as other religious affiliations. Local values are strongly informed by religion, with church leaders playing the dominant normative role in community life.

Currently, churches are the strongest force for development on Idjwi. Churches operate the majority of schools and maintain health centers, skill-training programs, and youth protection programs across the island. Additionally, the Baptist church of Bugarula operates CPR, Idjwi’s leading civic organization, which provides a remarkable array of development programming across the island.

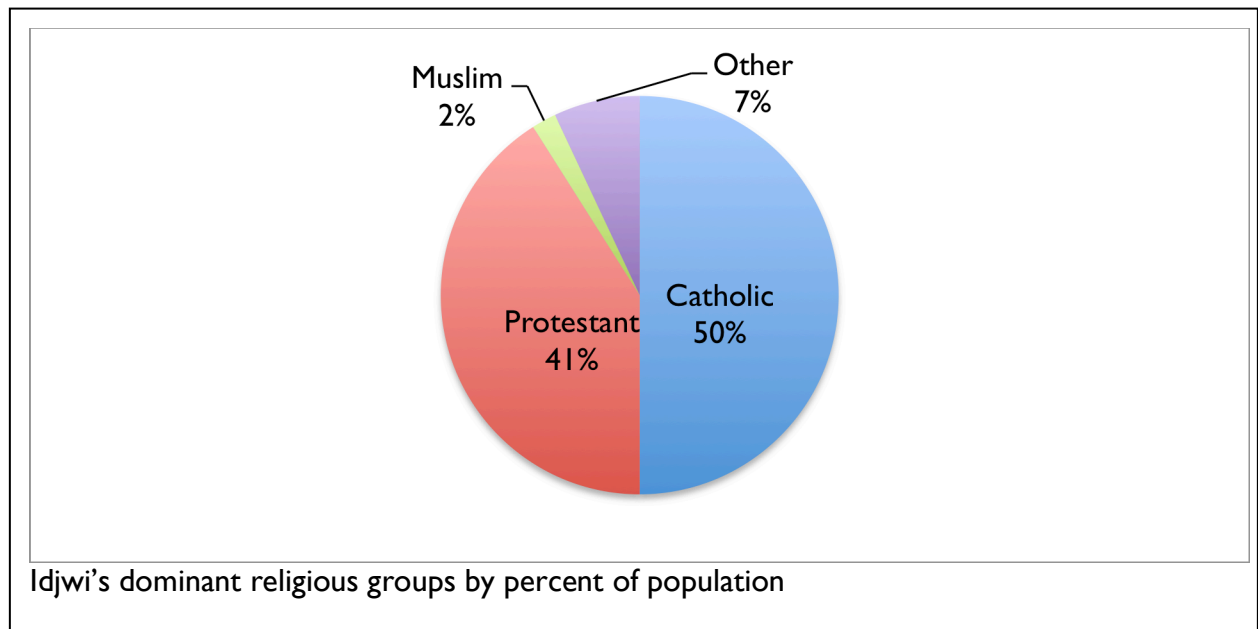
³⁹ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁴⁰ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁴¹ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁴² Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

Some government leaders believe that Idjwi's churches have substantial funding. This frustrates many church leaders, who cite chronic resource shortages. Church leaders are tired of trying to work with the government and now turn exclusively to NGOs for support.



Marriage. As described by Newbury, marriage is the major social event in the life of the individual⁴³. There is significant social pressure to marry during adolescence, as an unmarried woman at age 23 may become an object of ridicule⁴⁴. Additionally, many children may marry early in order to escape sexual restrictions imposed in the parents' household⁴⁵. Median age of sexual debut is 16.7 years, and median age of first marriage is 18.3 years, suggesting most women have intercourse before marriage. Men on average are 6 years older than their wives. Polygamy is fairly common, as 15 percent of women are in polygynous relationships. Divorce in recent years has been relatively frequent, but does not usually sever social networks⁴⁶. Celebration of marriages during harvest season (June-September) is, along with soccer games, a major community celebration.

2.6. Health Care. Idjwi is a single health zone, although its population is more than twice that of a typical DRC health zone. Idjwi hosts three small hospitals and roughly a dozen functioning health centers. Monvu Hospital (contact above) is the administrative center of Idjwi Health Zone, home to Idjwi's main pharmacy, and refers patients to Bukavu needing more advanced care. The zone is divided into 21 Health Catchment areas, each centering around a small health center. Local physicians have advocated to no avail for the island to be divided into two health zones and resourced accordingly. The director of Idjwi's health centers (contact above) is an important partner in any health intervention on Idjwi.

⁴³ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁴⁴ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁴⁵ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁴⁶ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

The federal government currently provides no support for Idjwi's health services or infrastructure. The majority of funding comes from user fees, making health care unaffordable for many poor residents. Some assistance is also granted by the Catholic Church (BDOM) and AAP/CORDAID. HEAL Africa also occasionally sends physicians on brief missions to Idjwi.

2.7. Security. Idjwi has never experienced war and remains very stable. Some male respondents referred to the island as the "Switzerland of Congo" for its beauty and eternal peace⁴⁷. Still, many vulnerable groups experience violence and abuse, particularly women, children, and Batwa (pygmies). Also, poverty and disease are among the worst in EDRC. This combination of poverty and security makes Idjwi a strong candidate for development assistance.

2.8. Civil Society, Humanitarian & Development Organizations. Idjwi's distance from markets has deterred significant industrial development. Described on the mainland as "the land beyond the mists," the island is thought by many to be home to smugglers and sorcerers⁴⁸. Additionally, the Congolese government has shown no interest in developing Idjwi. Consequently, development initiatives have been placed solely in the hands of local leaders⁴⁹. Indeed, improved social and economic contacts with the mainland are a major preoccupation of Idjwi's nurses, teachers, and administrative officials⁵⁰.

The *Centre Promotion Rurale* (CPR) is Idjwi's leading local civic organization. Founded in 1988 and respected throughout Idjwi, the organization is headquartered in Bugarula and decentralized across 40 small offices across the island. CPR maintains 13 permanent staff and 11 non-permanent staff. CPR's primary program is the *Program Initiative Feminin d'Idjwi*, a broad initiative to educate and empower women. They also have small programs providing family planning, reforestation, rental of land and livestock, education assistance for Batwa (pygmy), hospital infrastructure improvements, and community education via a local radio station. CPR receives funding on the order of \$100,000 per year from AED, a German Evangelical Church group. This is far from sufficient to fund CPR's potential programs. Contact information is provided above.

Currently, very few international organizations provide assistance to Idjwi. The Catholic Church in Bukavu (BDOM) and AAP/CORDAID both reimburse hospitals for some medical procedures. Amani Global Works, a small Congolese-American NGO, is attempting to raise funding to build a health center in Northern Idjwi. Contact information for these organizations is above.

2.9. Logistic Considerations for WV Programming

Transportation. Idjwi is accessible via the Goma-Bukavu speedboat route. Speedboats cost US\$50 and leave every hour. Speedboats dock at Bugarula in North Idjwi and at Monvu in South Idjwi. It takes approximately one hour to reach Idjwi by speedboat. Larger items, such as cars and generators, can be transported on slower barges that dock at Kihumba in North Idjwi and at Monvu in South Idjwi.

The map below illustrates which areas of Idjwi are accessible by car, motorcycle, and foot⁵¹. Villages range in size from several hundred to several thousand and may be closely or

⁴⁷ Sebisaho, J (2009). *Initial Assessment of Idjwi Island*. Amani Global Works.

⁴⁸ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁴⁹ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁵⁰ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

⁵¹ Initiative for Idjwi (2010). <http://idjwi.wordpress.com/map/>

sparsely spaced. In general, villages along the western shore are connected by a decent dirt road. Most of Idjwi's administrative and economic centers lie along this road, including Kihumba and Bugarula in the North, and Monvu, Kashofu, and Mugote in the South. The road is drivable year-round except for several sections in South Idjwi that flood during rainstorms. A drive between the island's Northern and Southern tips takes approximately two hours. Because of the boats that frequent Idjwi, gas is regularly available in the port cities of Kihumba, Bugarula, Monvu, and Kashofu. Some villages at high altitudes or along the distant eastern shore may be accessible only by foot or boat, but this is not the norm.

Housing, water, and electricity. Decent accommodations and running water are available in Bugarula, Kashofu, and Monvu. Power is provided only by a building's generator or solar panels. Guesthouses in Bugarula and Kashofu provide power for visitors.

Communication: There are several cell phone towers on Idjwi. MTN can be used on the eastern shores, AirTel and Vodacom in the west. There is a decent signal everywhere except some valleys. Bugarula has several computer terminals connected to satellite internet.

Safety. Idjwi is very safe, particularly for visitors. Harvard's research team felt safe walking at all times of the night and never had a problem with assault.

Potential Centers of Operations. Bugarula is probably the best location for a WV program office, for the following reasons:

- a) **Accessibility:** As a port town, Bugarula is accessible by speedboat from Goma and Bukavu. It also lies on Idjwi's main road, which connects most of Idjwi's major centers, and has access to gasoline.
- b) **Liveability:** Bugarula has two decent guesthouses with running water and electricity. Cell phones work well and there are several computers connected to satellite internet.
- c) **Administrative center:** Bugarula is the capital of Northern Idjwi and home to the government and *Mwami* of the North. It is also home to the Territory Administrator, Bugarula District Hospital, and CPR (Idjwi's major civic society organization).
- d) **Idjwi North:** As will be explained, Idjwi North has a significantly higher burden of poverty and disease than Idjwi South.
- e) **Having an Office on the Ground:** World Vision would be the first international NGO to have a staffed office on Idjwi since the 1990s. Currently, several other international NGOs provide some funding for programs, but none have a presence on the ground. As a result, these other programs have problems of accountability, transparency, and coordination.

3. KEY ISSUES OF WELL-BEING & VULNERABILITY

3.1. Community priorities. Different groups have different priorities. The greatest concerns for different groups are shown below. This data comes from household surveys and pairwise rankings performed in focus groups and key informant interviews.

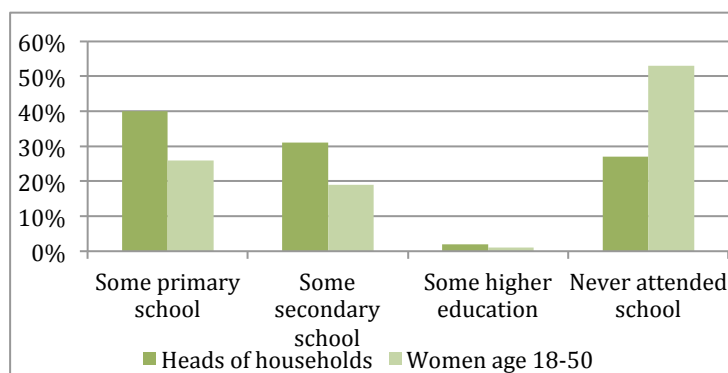
- a) **Batwa (pygmy) groups:** Empowerment, microcredit, education for children, land ownership, security, access to health care, equality in the justice system.
- b) **Female survivors of violence:** Education and employment for men, female empowerment, security, strong and accessible justice system.
- c) **Women age 18-50:** Income, education and employment, land ownership, improved crop yield, child mortality, infectious diseases, reproductive illnesses, intimate partner violence.
- d) **Town hall meeting attendees:** Infrastructure improvements, including hospitals, schools, roads, and community centers where they can learn agriculture, fishing, and pottery techniques.
- e) **Territory Administration: Electricity, better jobs for people, banana disease, more efficient agriculture techniques, new prison, court, and government buildings, a bank and credit system.**
- f) **Government of Northern Idjwi:** Deforestation, corruption, poor justice systems, and lack of government support for infrastructure like roads, prisons, courts, and other official buildings.
- g) **Government of Southern Idjwi:** Crop disease and malnutrition, population growth and environmental, lack of skills training for women, poor geographic access to hospitals.
- h) **Bureau of Education:** Better education infrastructure, teaching supplies, higher salaries to attract better teachers, subsidies for school fees, solution to banana epidemic.
- i) **Chief of Police:** More police officers, better police buildings, better prison, better court, higher police salaries
- j) **Idjwi Rights Defenders:** Court of peace, lawyers, secure prisons, government accountability and transparency, end to eastern congo conflicts
- k) **Centre Promotion Rurale** (Idjwi's major civic organization): Agriculture issues (crop disease, unskilled workers, inefficient use of land, land scaring, lack of good seeds, lack of crop diversity), population control, electricity, health care supplies and personnel, products for animal husbandry, radio station equipment.
- l) **UFIN** (Idjwi's premier women's organization): Gender equality in workplace, classroom, and courtroom; better jobs for women; solution to banana crisis.
- m) **Catholic Church Groups:** Health care, health insurance, clean water, deforestation, better roads, better schools, gender equality, guaranteed education for all children, skills training for vulnerable women, protection of orphans and widows, better churches, spreading the gospel
- n) **Protestant Church Groups:** Food security, better agriculture techniques, poverty, education, new health centers, skills-training for women, spreading the gospel
- o) **Kihumba Hospital:** Financing of care, two additional specialized physicians, running water, solar panels and battery stores, ambulance, internet, mattresses and sheets.
- p) **Bugarula Hospital:** Financing of care, four additional specialized physicians, better equipment, such as ultrasound, better latrine, contraceptive supplies, ambulance.
- q) **Monvu Hospital** (Idjwi's referral hospital): Financing of care; two additional specialized doctors and four additional nurses; better health education programs around HIV/AIDS, TB, and SGBV; better nurse training programs; programs in neurology and rehabilitation; better water supply; an intensive care unit; a proper morgue; a diagnostic lab; internet and video

conference capability; X-ray, ultrasound, blood transfusion, neonatology, and operating room equipment.

- r) **Idjwi's Health Centers & Main Pharmacy:** Sustainable financing of care, training for nurse staff, materials for educating patients about HIV/AIDS, nutritional supplements, sustainable drug supply.

3.2. Poverty, Education, and Employment

3.2.1. Education. Idjwi has 149 primary schools and 64 secondary schools, most with religious affiliations. The island's bureau of education receives only \$200 per month from the provincial government. All other costs are covered by school fees, which are a significant deterrent to seeking education, particularly among pygmy children⁵².



Limited financing makes it difficult for Idjwi to attract and retain honest, talented teachers. Respondents gave many instances of teachers asking for money or sex to adjust a student's performance. Additionally, schools cannot afford books or other supplies. Students copy everything from the blackboard to their journal.

Among heads of households, 27 percent had never attended school, 40 percent had some primary education, 31 percent had some secondary education, and 2 percent had some higher education. The majority of female respondents (53%) never attended school and only 3 percent were still in school at the time of the survey. Among women that attended school, 80 percent had completed primary school, 35 percent had completed secondary school, and less than 1 percent had pursued higher education. School life expectancy among women was 6 years, compared to 7 years among women in the DRC as a whole⁵³. 9 percent of currently eligible children were enrolled in secondary school, half of whom were female. The above figure depicts educational attainment for respondents and their husbands.

Only 20 percent of women can easily read and understand a newspaper and 40 percent reported being completely illiterate. (In the DRC as a whole, 59 percent of women are able to read a simple statement about everyday life⁵⁴. Although there is some difficulty in comparing these indicators, it appears that female literacy on Idjwi is no better than in the DRC as a whole, and possibly quite worse. Still, this represents a substantial improvement in female literacy on Idjwi since 1983, when another study found only 1 percent of women able to read⁵⁵.

3.2.2. Skills-training: readiness for economic opportunity. Idjwi has two nursing schools that train the majority of the Island's health care workers. CPR, Idjwi's leading civic organization, provides some training on advanced agricultural methods and animal husbandry.

⁵² Bideri, C & HP Hergum. *The Pygmies of the Great Lakes: An assessment of the Batwa/Mambuti Situation in Burundi & Eastern part of the Democratic Republic of Congo and Batwa/Batwa Organizations in Bukavu (DRC) and Bujumbura (Burundi)*. Norwegian Church Aid Occasional Paper Series No. 02/2004.

⁵³ CIA World Fact Book (2011). <https://www.cia.gov/library/publications/the-world-factbook/>

⁵⁴ CIA World Fact Book (2011). <https://www.cia.gov/library/publications/the-world-factbook/>

⁵⁵ Carael, M & J Stanbury. *Promotion of Birth Spacing on Idjwi Island, Zaire*. *Studies Fam. Planning* (1983); 14,5:134-142.

Churches across Idjwi also provide sewing, craftwork, and agriculture for widows and unmarried mothers. All of these institutions, however, are chronically under-resourced.

3.2.3. Employment. Idjwi exists largely in an unindustrialized subsistence agricultural tradition without other sources of cash income⁵⁶. Women do most of the work in the fields, which typically takes 24-40 hours per week. For two-thirds of women this is their primary occupation. 31% of women generate additional income through a private business, usually selling cultivated goods; 2 percent of women had paid government jobs.

The vast majority of heads of household are also subsistence farmers. A small fraction of adult men hold positions outside the household, and typically work as vendors, teachers, fishermen, mason/carpenters, motorists, and laborers. Idjwi's elite class consists of religious and government officials, physicians, and affiliates of the royal families. Ten percent of men were reportedly too sick to work.

3.2.4. Income & expenditures. We estimate that the average household on Idjwi takes in \$400 of hard cash per year (unadjusted). However, given substantial income inequality, the *median* household likely takes in far less. On Idjwi, as in the DRC as a whole, approximately 50% of the population lives on less than US\$1 PPP per capita per day⁵⁷. A typical salary for a man is 1000Fc per day, compared to 700Fc for a woman. For 80% of women, their income was less than their husband's. Less than 5% of households have access to a bank.

There is significant income disparity, with Idjwi's top income decile earning 81% of all income. This disparity is worse than that in the DRC as a whole, where the top income decile accounts for 35% of all income⁵⁸.

Focus groups suggest that the average household requires \$10-12 per day to cover education, health care, food, clothes, justice, and other rights. However, the average household collects only US\$1-2 per day.

Households on Idjwi are currently *getting poorer* due to the banana and cassava epidemic, which is forcing many families to sell belongings for food, school fees, and other pressing needs.

For most respondents, poverty was the most pressing concern, along with illness and disease. Respondents repeatedly prioritized improved education and employment opportunities, more land, and improved crop yield. As one respondent stated, "each day, we suffer so much looking for money."

⁵⁶ Carael, M & J Stanbury. *Promotion of Birth Spacing on Idjwi Island, Zaire*. Studies Fam. Planning (1983); 14,5:134-142.

⁵⁷ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁵⁸ CIA World Fact Book (2011). <https://www.cia.gov/library/publications/the-world-factbook/>

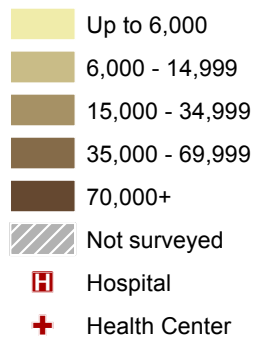
Average Household Monthly Income

By Health Catchment Area*, Idjwi, DRC

*Health Catchment Areas are approximated using thiessen polygons. All facilities that were reported as having a patient catchment in the 2009 Health Report by the Idjwi Central Health Bureau were used (see below).

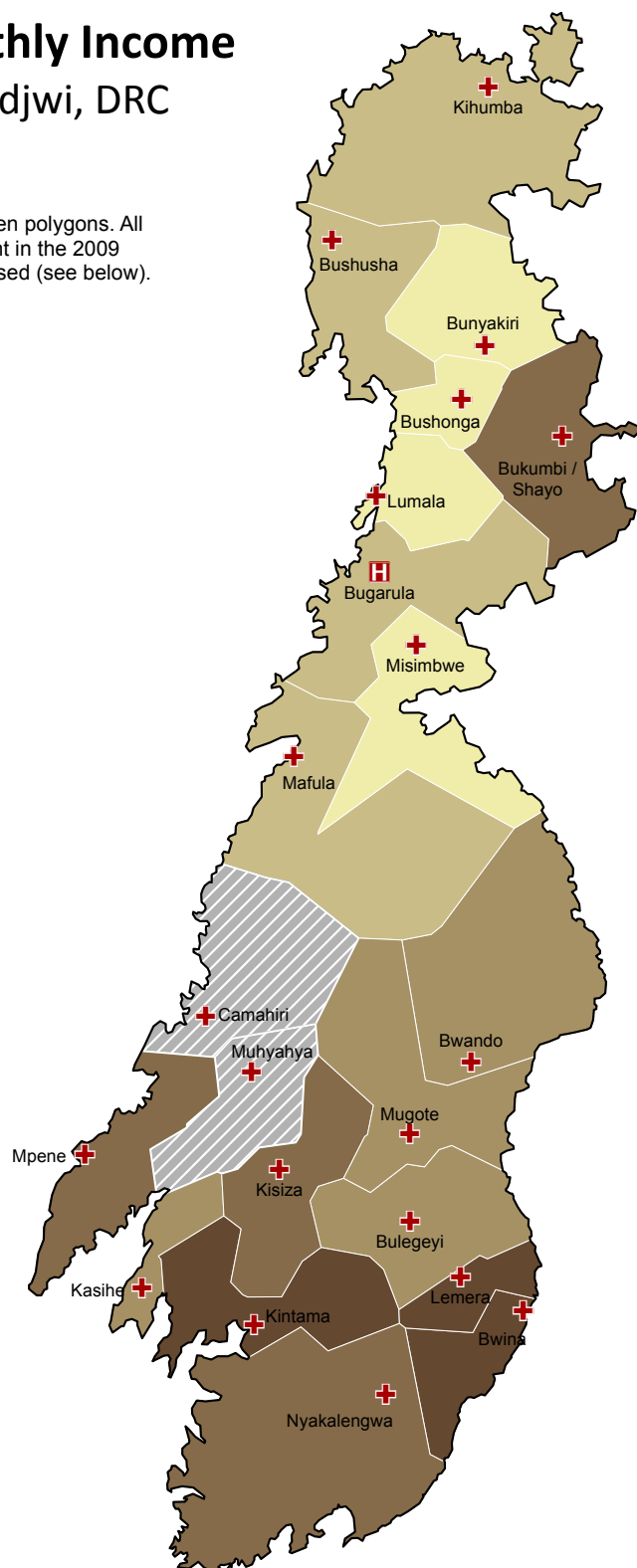
Shape *	Name	2009 Catchment Pop
Point	Bugarula	14,200
Point	Bukumbi / Shayo	10,110
Point	Bulegeyi	14,500
Point	Bunyakiri	11,693
Point	Bushonga	6,608
Point	Bushusha	8,319
Point	Bwando	8,230
Point	Bwina	6,299
Point	Camahiri	10,291
Point	Kasihe	4,873
Point	Kihumba	12,190
Point	Kintama	10,082
Point	Kisiza	9,733
Point	Lemera	6,404
Point	Lumala	7,426
Point	Mafula	6,979
Point	Misimbwe	8,172
Point	Mpene	8,951
Point	Mugote	13,176
Point	Muhyahya	9,240
Point	Nyakalengwa	15,825

Income (Congolese francs)



0 2 4 8 Kilometers

Produced by the Initiative for Idjwi, idjwi.initiative@gmail.com (c) 2011



3.2.5. Ownership/possessions. Less than one third of households (31%) own any agricultural land. 88 percent of households own their own houses, while 9% are renting. The majority of households live in separate houses or huts (72%). Most roofs are made of metal sheeting (49%) or thatch (36%). Most houses have 1 room (20%), 2 rooms (25%), 3 rooms (24%), or 4 rooms (18%), usually with between 0-4 windows. A minority of households owned a radio (40%), mobile phone (39%), solar panel (20%), generator (9%), or motorcycle (5%). Nearly half of all households rely on kerosene lamps for light, while 14% rely on solar. On average, twice as many households use solar panel in North Idjwi, compared to Southern Idjwi. 29% of households across Idjwi have no independent source of lighting.

3.3. Protection & care

3.3.1. Vulnerable subpopulations

Children. Approximately 10% of children do not receive national birth certificates. Responsibility for registering new children lies with the village chief.

18% of all children had at least one deceased parent, compared to 25% in the DRC as a whole⁵⁹. Idjwi's leading children's organization estimates that 15% of children on Idjwi are orphans, often due to drowning of parents in the lake. Orphans often work in houses for food, sometimes as indentured servants. For want of food, children sometimes runaway from home. Church and civic organizations try to identify these children and return them to their families.

Most families work children extremely hard. It is not uncommon to see girls age 6-10 wearing new shoes and carrying enormous bundles of sticks or boxes of CocaCola across Idjwi's mountains. When children return from school, they go straight to work, leaving no time for homework.

Among children ages 4-9, 45% had their own pair of shoes, 33% had only one set of clothing, and 20% had their own blanket. As detailed below, children on Idjwi also suffer a disproportionate burden of hunger and disease.

Child abuse is common on Idjwi. The island's leading women's organization, UFIN, estimates that 80% of households beat children age 10-17 very seriously. According to one leader, "We tie hands and feet and beat like an animal...sometimes burn their arms with the side of a hot knife...It is our culture to beat a child very hard so they don't repeat." These parents are held accountable only if there are visible wounds, particularly on the head. Children are rarely jailed with adults, although there were several instances in the past year.

Batwa (pygmy). Idjwi is home to nearly 7,000 Batwa (also, "Pygmies," "Barhwa," or "Bambuti"), the indigenous people of the Lake Kivu basin. Idjwi's 20 Batwa camps are listed in the accompanying figure. To many residents, they are viewed as subhuman creatures, rather than full people. As one Batwa respondent expressed, "Most Muhavu don't take us like persons. They say 'I can't eat

Idjwi's 20 Batwa camps

1. Bugarula Center
2. Kagohua – Mafula
3. Kibanda – Mulehe
4. Bunyakiri Center
5. Buruhuka – Bunyakiri
6. Buleherwa – Bukumbi
7. BOZA – Kihumba
8. Katchuba – Kihumba
9. Ishenge – Kihumba
10. Makutano – Kihumba
11. Mulungu – Kihumba
12. Kisiza – Idjwi Sud
13. Kamulekezi – Idjwi Sud
14. Kabonkeke – Idjwi Sud
15. Kamashuli – Idjwi Sud
16. Karhanywabozi – Idjwi Sud
17. Butimbo – Idjwi Sud
18. Kiohenyi – Sakiro
19. Mugote Centre
20. Karama – Idjwi Sud

⁵⁹ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo.*

with a Pygmy’.” As a severely oppressed minority, Batwa have no rights to land, education, fishing, hunting, justice, or political representation.

Meetings at Batwa camps revealed a plethora of problems. They are forced to move from place to place, and live in makeshift shelters on unproductive land. Pottery is their principal source of income. As a result, Batwa households earn 1/10th the income of Havu households, 22.6% more Batwa women than Havu women never attend school, and 25.1% fewer Batwa deliveries than Havu deliveries are assisted by a skilled birth attendant. Additional statistics are shown in the table below.

Indicators: Havu vs. Batwa	Havu	Batwa
Crude death rate (per 1000 population)	27.7	43.5
Last birth attended by skilled health worker	66.8%	41.7%
Woman goes to health facility when sick	67.6%	50.9%
Woman never attended school	52.8%	75.4%
Female literacy	38.2%	19.4%
Household often without enough to eat	25.2%	50.6%
Number of people in household	5.1	4.8
Rooms in house	2.8	1.5
Average household monthly income (Fr)	59,876	6,293

Idjwi North. Idjwi North performs significantly worse than Idjwi South on most development indicators. Far more households in the North compared to the South reported that their income was insufficient to meet their needs. 26% of households in the North own their own land, compared to 35% in the South. 2% of households in the North have access to a bank account, compared to 10% in the South. 77% of households in the North have no access to electric power, compared to only 55% in the South. As shown below, households in the North suffered from greater food insecurity than those in the South.

There was a dramatic difference in crude death rate; in the North the crude death rate was approximately 38 per 1000 per year, compared to approximately 20 per 1000 per year in the South. In the North, 34% of those who recently died received medical support, compared to 49% in the South.

In 2010, in the North, 63% of children had no more than one meal the day before the survey, compared to 42% in the South. In the North, 40% of the youngest children in the household had had diarrhea in the last two weeks, compared to 30% in the South. Among households’ youngest children in the North, 21% have their own pair of shoes, compared to 54% in the South.

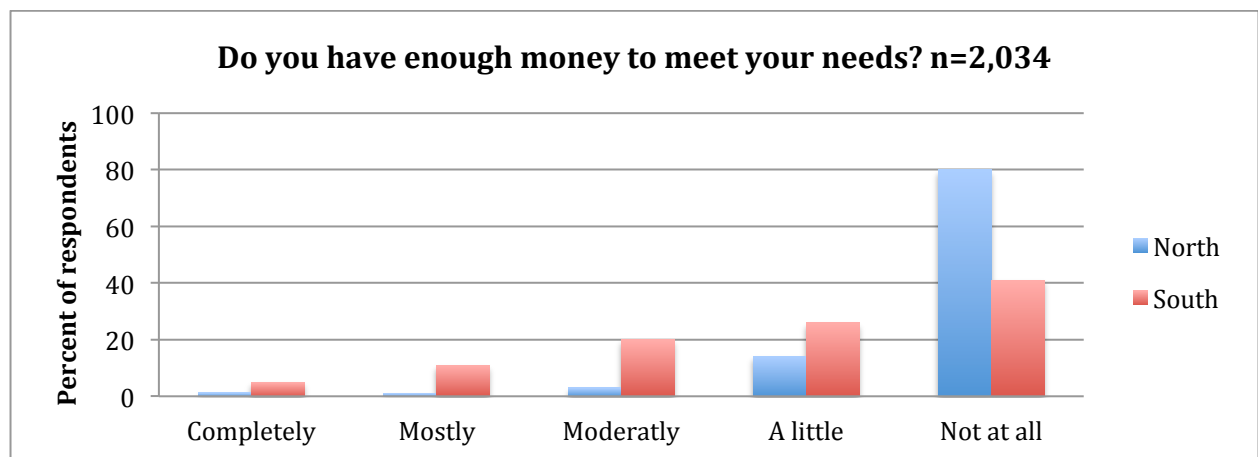
Illiteracy among women was 43% in the North, compared to 38% in the South. 26% of women in the North described themselves as gainfully employed, compared to 42% in the South. In both the North and South, 85% of women expressed that decisions about their own health care were left to their husband. 56% of women in the North say it is “common” or “very common” for a woman to be beaten by her husband/partner, compared to 48% in the South. 45% of women in the North say it is “common” or “very common” for women to be forced by someone other

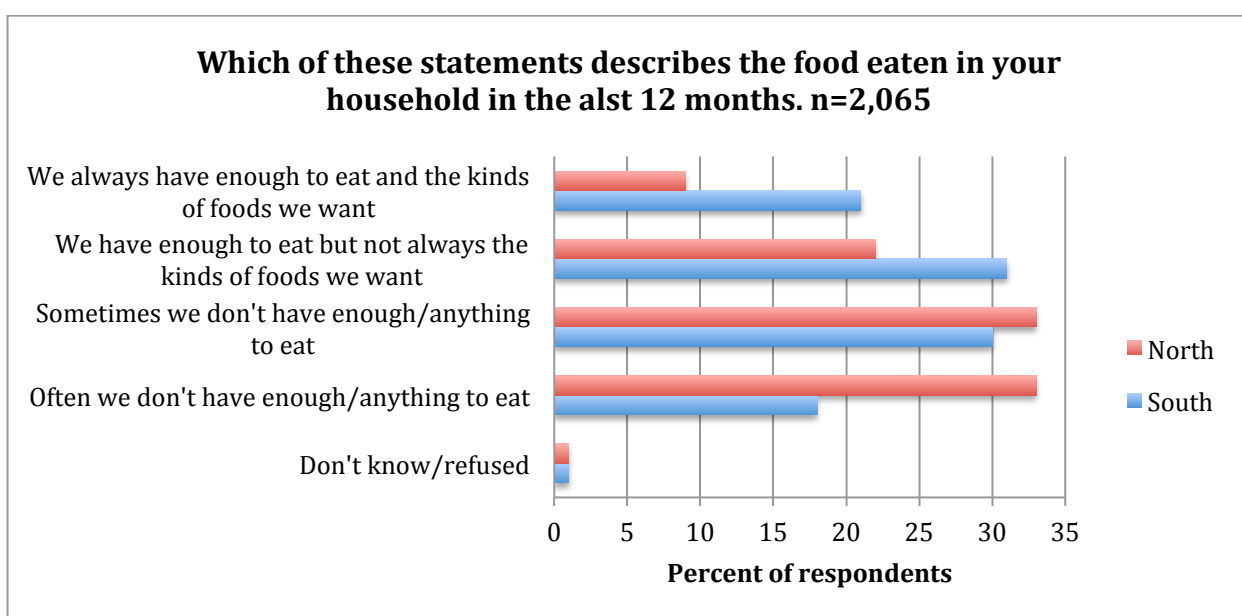
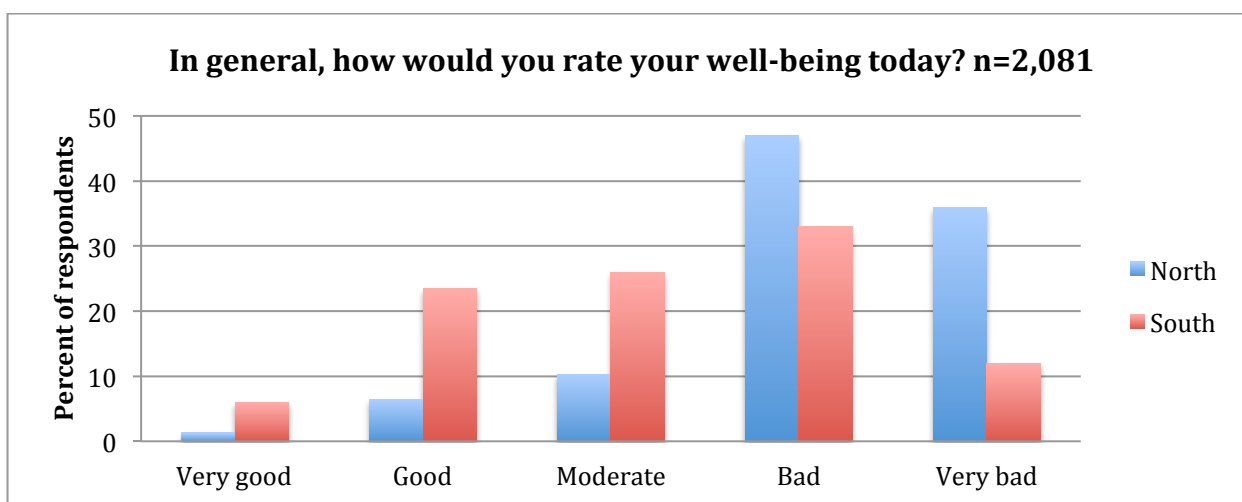
than their husband/partner to have sexual intercourse against their will, compared to 34% in the South. Women felt that a husband is justified in beating his wife if she argues with him 67% of the time in the North and 69% in the South. Overall, women in the North rated their well-being as worse, on average, than women in the South (see below).

In the North, 54% of women received assistance from a trained birth attendant during their last delivery, compared to 80% in the South. 12% of women in the North had received information about family planning in the last 12 months, compared to 19% in the South.

In the North, 22% of women knew of a place where they could get condoms, compared to 29% in the South. However, in both the North and South, only 17-18% of women felt they could ask their husband to use a condom. In both the North and South, 95% of people had heard of HIV/AIDS, and approximately 30% knew a place where they could get tested.

Indicators: North Idjwi vs. South Idjwi	North	South
Population (2012)	~100,000	~130,000
Crude death rate (per 1000 population per year)	38	20
Percent of recently deceased who received medical care in last six months of life	63%	42%
Percent of children having no more than one meal the day before the survey (2010)	67.6%	50.9%
Percent of children having their own pair of shoes (among youngest children in the households)	21%	54%
Percent of children having diarrhea the two weeks prior to the survey (among youngest children in the households)	40%	30%
Illiteracy among women	38%	26%
Women receiving assistance from a trained birth attendant during last delivery	54%	80%





3.3.2. Women: agency & empowerment. Female informants expressed concern about the inequality between men and women on Idjwi. Few informants could identify any mechanism for redress. As one respondent expressed, “We ask, what can we do, us women, because we are always behind?”

On Idjwi, women have little agency within their marriages. According to one respondent, “The husband is the chief in his home and the wife is just the wife.” To another, “The husband will show you what you have to do and you must do it.” In 80% of households, husbands decide exclusively how to spend any income, compared to 40% in rural DRC as a whole⁶⁰. Men on Idjwi traditionally have rights of ownership to everything in the household, and this right is upheld by the island’s cultural tribunals. Only one third of women feel they can say no to their husband/partner if they do not want to have intercourse. Decisions about health care for the respondent are made by their partner in 85 percent of households. *Only 7 percent of respondents reported that they could make decisions independently about their health care.*

⁶⁰ MEASURE DHS (Macro Int). Demographic & Health Survey 2007 - Democratic Republic of the Congo.

Many factors contribute to women's disempowerment. Strong patriarchal customs on Idjwi further reinforce the marginalization of women by putting men in roles of primary decision-maker for households and, conversely, valuing women for their ability to bear and raise children. 53% of women have no formal education, compared to 27% for heads of households. Women earn less than their husbands in 80% of households. Women marry on average at age 18 to a man 6 years her senior. 18% of women began living with their partner before age 16. Additionally, Discriminatory legislation and customs that ascribe strict gender roles also act to marginalize women. National law, for instance, requires a married woman to obtain permission from her husband to bring a case to court⁶¹. The very low social and political status of women is linked with pervasive sexual and gender-based violence in the eastern DRC (see below).

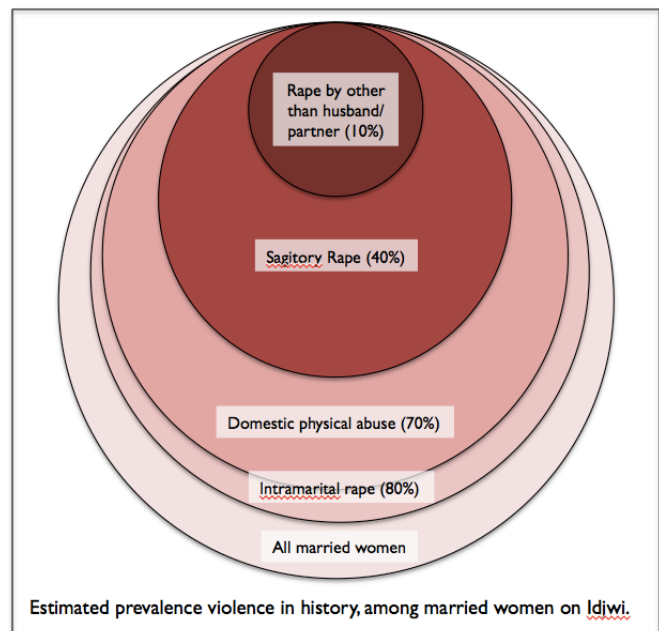
3.3.3. Sexual & gender-based violence.

Intimate partner violence. Leaders of Idjwi's premier women's organization, UFIN, judge that 70% of married women have been physically beaten by their husbands. A significant proportion of women reported that in their community it is common or very common for a woman to be beaten by (52%), verbally threatened by (48%), or forced to have sex with (40%) with her husband or partner. This constitutes sagitory rape for women who marry under the age of 18 (nearly half of Idjwi's population).

Ethnographic research confirmed that violence is a major problem impacting women's daily lives. Many informants had visible bruising and other injuries from intimate partner violence. Respondents expressed that "many women are beaten to the point where they needed medical attention," sometimes so badly that they "risk miscarrying their fetus."

All informants responded that there is no current mechanism for redress or victim care. Current systems have failed women and forced many victims to accept high levels of gender-based violence as the community norm. Indeed, a majority of women believe that a husband is justified in hitting or beating his wife if she goes out without telling him (80%); neglects the children (76%); argues with him (68%); refuses to have sex with him (70%); or burns the food (58%). According to some respondents, the best way to reduce domestic violence would be to provide employment for their husbands, granting them with dignity and daily activities away from home.

Extramarital violence against women. South Idjwi's chief of police estimates that 5-10% of women have been forcibly raped by someone other than their husband/partner. Interviews revealed that many women on Idjwi, particularly the marginalized Batwa population, have experienced violent rape of the sort associated with DRC's civil conflict. Over one third of



⁶¹ DRC Code de la Famille. Article 448. www.leganet.cd/Legislation/Code%20de%20la%20famille/Table.htm

women (36%) reported that it is common or very common in their community for a woman to be forced by someone other than her husband or partner to have sexual intercourse against her will. All women of Batwa ethnicity who participated in ethnographic research reported rapes and forced pregnancies by Bantu men (mostly land owners). Some women reported kidnappings for the purposes of being raped. Overall, Idjwi presents different scenario from the mainland, where rape at the hands of paramilitary groups is more common. Perpetrators are often drunks, soldiers, police, bandits, and uneducated men.

Normalization of violence: Respondent believes that a husband is justified in beating his wife if:		Reported prevalence of violence against women	
She goes out without telling him	80.4%	It is "common" or "very common" for a woman in the community to be forced by her husband/partner to have sexual intercourse against her will	39.4%
She neglects the children	76.0%	It is "common" or "very common" for a woman in the community to be forced by someone other than her husband/partner to have sexual intercourse against her will	35.6%
She argues with him	68.3%	It is "common" or "very common" for a woman to be verbally threatened by her husband/partner	48.1%
She refuses to have sex with him	69.9%	It is "common" or "very common" for a woman to be beaten by her husband/partner	52.3%
She burns the food	57.8%		

3.3.4. Security. According to South Idjwi’s chief of police, the island has half the number of policemen necessary. These policemen receive a monthly salary of only \$50, have nowhere to live, and are away from their families and systems of accountability. Consequently, they are easily corruptible. Common crimes include failure to fulfill contracts, stealing, conflict over land ownership, sagitory rape, and domestic abuse. Robberies are increasing due to rising poverty, and occasionally result in murder. Consequently, some communities are considering building their houses closer together. Victims of violence crime are usually women, children, and Batwa (pygmies). There has never been an attack on a foreigner.

Apart from isolated events, Idjwi has never experienced war and remains very stable. Some male respondents referred to the island as the “Switzerland of Congo” for its beauty and eternal peace⁶². Still, poverty and disease are among the worst in EDRC. This combination of poverty and security makes Idjwi a strong candidate for development assistance.

3.3.5. Justice

Focus groups revealed that most individuals have full knowledge of their human rights. The results are shown in below. Despite this knowledge, Idjwi’s justice system remains in tatters. There is no good prison on Idjwi. Convicts are regularly tortured—once in the morning, and once in the evening—and are required to pay 1000Fc daily for food.

There is no court on the island and only a handful of lawyers. Judges from the police force handle cases related to severe violence. Almost all other cases are decided by traditional tribunals. There are tribunals at the level of the village, groupment, and chefferie. Tribunals are led by the most important *men* in the community, such as village chiefs and kings. Cronyism is commonplace between judges and defendants. Leaders of Idjwi’s premier women’s organization, UFIN, suggested that 90% of judges are corrupt, often asking for money or sex from the concerned party. UFIN’s leaders also suggest that the government has actively prevented a court from being built on Idjwi because they enjoy “a monopoly on justice.”

⁶² Sebisaho, J (2009). *Initial Assessment of Idjwi Island*. Amani Global Works.

Traditional tribunals discriminate against women. There are no female judges at any level. There is an absence of specific laws targeting intimate partner violence. Fines paid to female victims are often snatched by their husbands or fathers. Women who bring their husbands to trial for abuse or forced sex are often laughed out of the tribunal, convicted of a minor crime, or tossed out by their husbands afterwards. Most respondents suggested that it is nearly impossible to seek justice against a man, particularly a husband, who abuses a woman. Women only have success in the justice system if they are well-educated and can afford legal help. Still, even if a perpetrator is convicted of a crime such as rape, he can easily bribe his way out of jail.

Batwa are also victims of the justice system. Recently, 7 Batwa villagers were slaughtered by Bantu men, but the government did nothing until NGOs became involved. Batwa women report that they are unable to access systems for healing and redress because they are not deemed worthy of such protections. As one Batwa respondent expressed, “If I go alone [to seek justice] they will not respect me. If I were to go alone, the police will do everything they can to say that I don’t have reason to be there. They may even put them in prison for bothering them.”

Knowledge of Human Rights

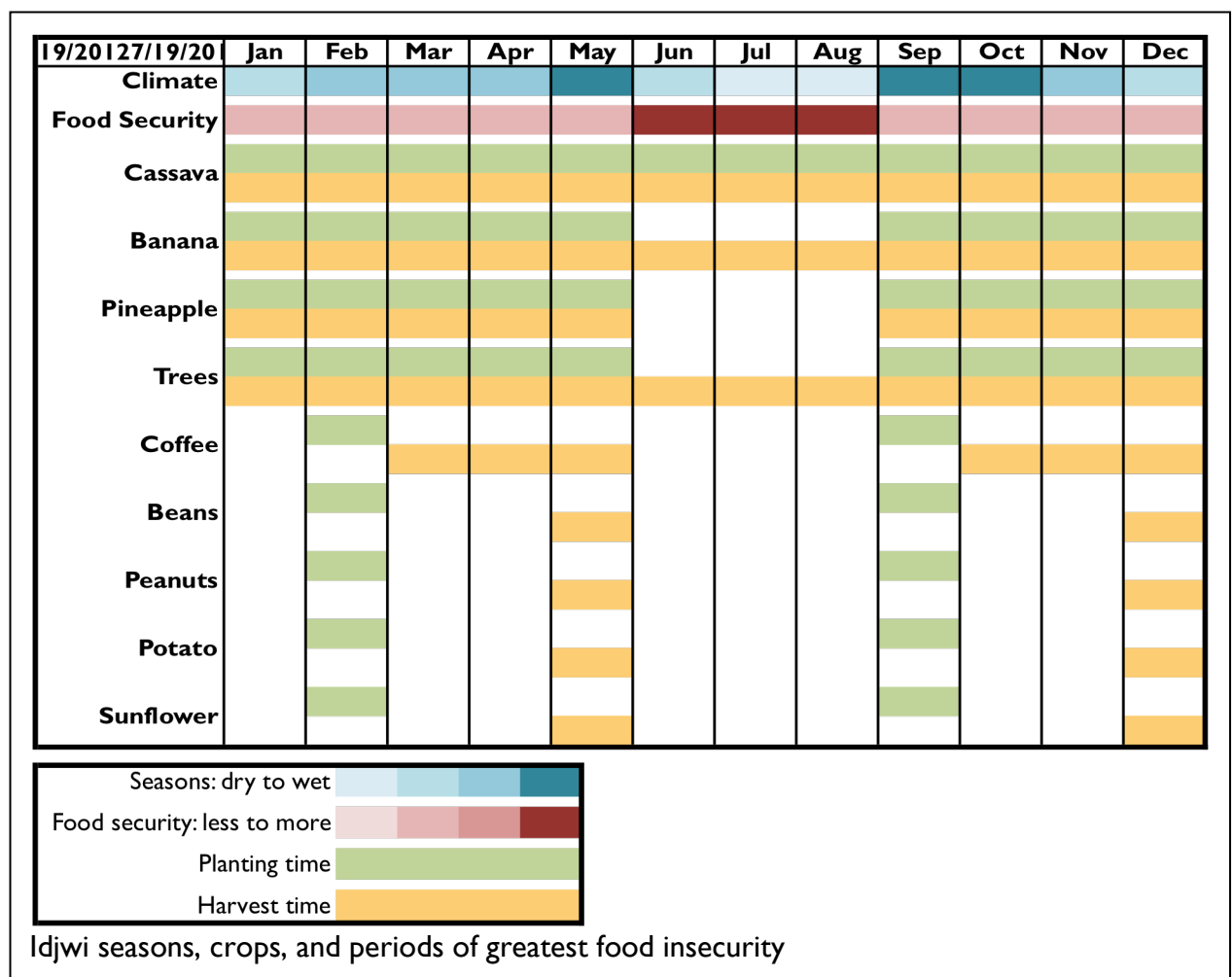
Sample of 5 focus groups from across Idjwi,
n=20 men and 25 women

	Yes	No	% Yes
I have a right to live	45	0	100%
I have a right to protection	45	0	100%
I have a right to security	45	0	100%
I have a right to health care	45	0	100%
I have a right to education	45	0	100%
Men and women have an equal right to education	45	0	100%
Men and women are equal before the law	20	25	44%
Men and women should be equal before the law	45	0	100%
Men have a right to discipline their wives and girls by beating them	4	41	9%
Women and girls can inherit property from their husbands and fathers	35	10	78%
Rape is against the national and international law	45	0	100%
Police and military officers have a right to forcefully take property from anyone	0	45	0%

3.4. Food

3.4.1. Agriculture, Livestock, and Diet. The vast majority of residents on Idjwi are subsistence farmers. The major food-calorie crops are banana and cassava, which are grown primarily in Northern Idjwi. Other crops include beans, bananas, sweet potatoes, maize, sorghum, plantains, groundnuts, gourds, peas, pineapples, taro, coffee, tobacco, yams, and cassava. Locals raise cattle, goats, sheep, pigs, chickens, and turkeys⁶³. Additionally, many locals, particularly men, drink banana wine or beer when it can be afforded. The typical Idjwi diet consists of banana, cassava, beans, lengalenga (green leafy vegetable), sambaza (tiny fish), mandazi (fried dough), and cooking oil. Fish are the only wild source of food and are not a principal component of the diet.

Almost all farmers use basic tools, poor seeds, and inefficient techniques for raising crops. After harvest, farmers frequently engage in bush burning, which damages the soil for future use. Hardly any farmers have access to fertilizers.



⁶³ Newbury, DS (1991). *Kings & Clans: Ijwi Island and the Lake Kivu Rift: 1780-1840*. U of WI Press.

	Time to grow/sell	Sold off-island	Price by local unit	Price trend 2011-2012	Notes
Cassava	1 year	Yes	\$45 per large bag	Increase due to crop disease	
Banana	1 year	Yes	\$6 per bunch	Rapid increase due to crop disease	
Pineapple	1 year	Yes	550Fc per fruit	Increase due to soil degradation	
Coffee	4 years	Yes	\$1.20 per 1kg	Slight decrease due to global markets	#1 cash crop on Idjwi
Beans	3 months	No	1200Fc per 1.25kg	Increase due to soil degradation	
Peanuts	3 months	No	1200Fc per 1.25kg	Increase due to soil degradation	
Sunflower	3 months	No	1000Fc per 1.25kg	Increase due to soil degradation	
Potato	3 months	No	100Fc per potato	Increase due to soil degradation	
Trees	5-8 years	Boards, yes	\$5 for 15cm diameter	Rapid increase due to deforestation	1m diameter tree is \$100 on Idjwi vs \$10 in Butembo
Turkey	1 year	Yes	\$25 male; \$15 female	Stable because more people breeding	#2 cash crop on Idjwi
Chicken	1 year	Yes	\$12 male; \$8 female	Increasing because of disease epidemic	
Cow	3 years	Yes	\$350-\$500	Stable	New high milk-production cows from Uganda go for \$800
Goat	3 years	Yes	\$50 (good goat)	Increasing because of demand for bride price, other ceremonies	New many-offspring goats from S Africa go for \$100
Pig	2 years	No	\$150 (good pig)	Decreasing because easy to grow pigs quickly, but hard to keep many, so must sell	
Guinea pig	3 months	No	1500Fc per pig	Stable	
Sambaza	wild	Yes	100Fc per 8 fish	Increasing because nets stolen from Rwandan fisherman	
Large fish	wild	No	1400Fc per 3 fish	Increasing because overfished	

Economic of Idjwi's major crops and livestock

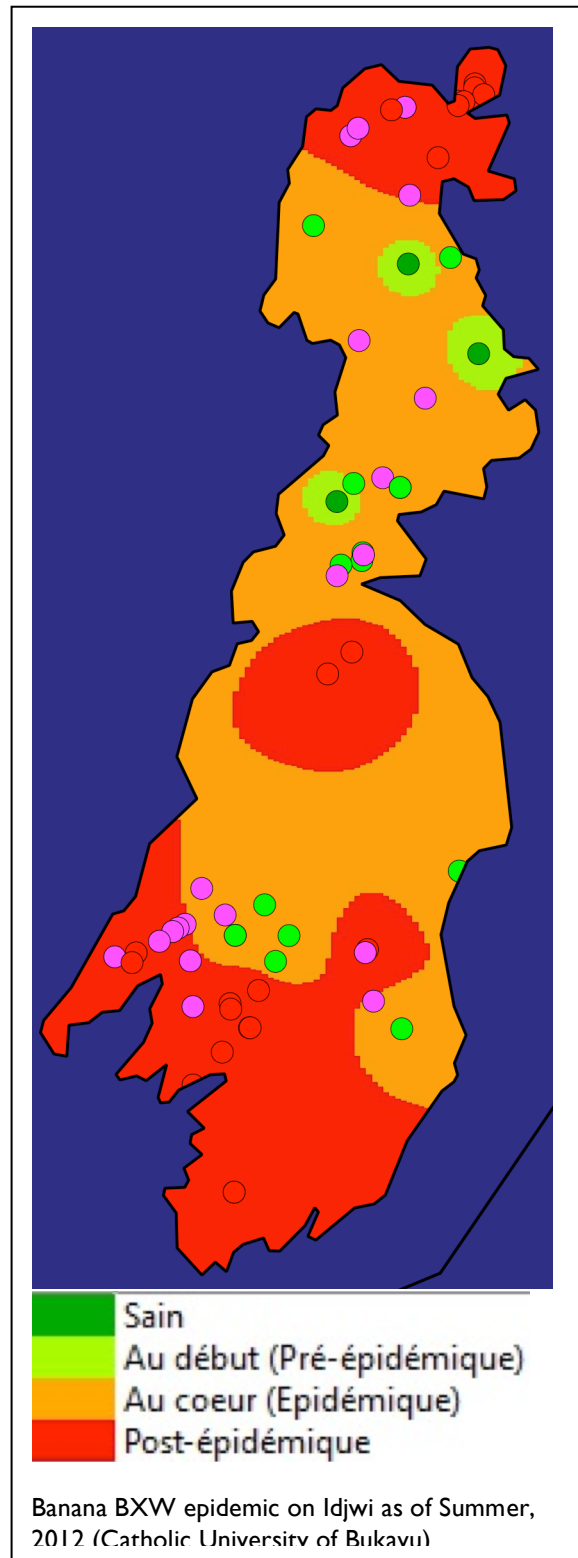
3.4.2. Hunger and Malnutrition. An epidemic of banana and cassava disease is currently sweeping Idjwi. Bananas harden, darken, and become inedible even for animals. According to Idjwi's leading civic organization (CPR), 60% of banana crops are now infected and *the number of malnourished children has doubled in the last six months*⁶⁴. As described by OCHA, "On Idjwi, the population is desperate and the humanitarian challenge daunting"⁶⁵.

The socio-economic consequences of the epidemic are strongly felt as inhabitants live almost exclusively from farming⁶⁶. Families are coping by selling livestock, pulling children out of school, neglecting health care, and farming land that should lie fallow. CPR's director stated in May 2012 that "All of social life which deconstructs: we are seeing an increase in theft and conflict in communities, and instances of mob justice are increasing and are particularly violent. Illiteracy and migration away from rural areas is growing [...] People are helpless"⁶⁷. CPR is currently using its meager resources and community radio station to broadcast information about disease prevention.

The spread of the banana BXW epidemic is shown in the adjacent figure. Currently, over half of all crops contain infected bananas. According to predictions by the Catholic University of Bukavu, the epidemic is expected to grow worse over the coming year.

In 2010, *even before the epidemic began*, 52% of households sometimes or often did not have enough to eat. 87% of households had to skip or cut the size of meals; for two thirds of households this occurred almost every month. Virtually all children under age 5 (98%) received at least one meal per day, *but half of children received no more food than this*. Some respondents reported that their children could not attend school because of hunger.

Chronic food shortages are especially



⁶⁴ OCHA IRIN Humanitarian News & Analysis (2012). DRC: "Banana Aids" threatens social fabric on Idjwi Island."

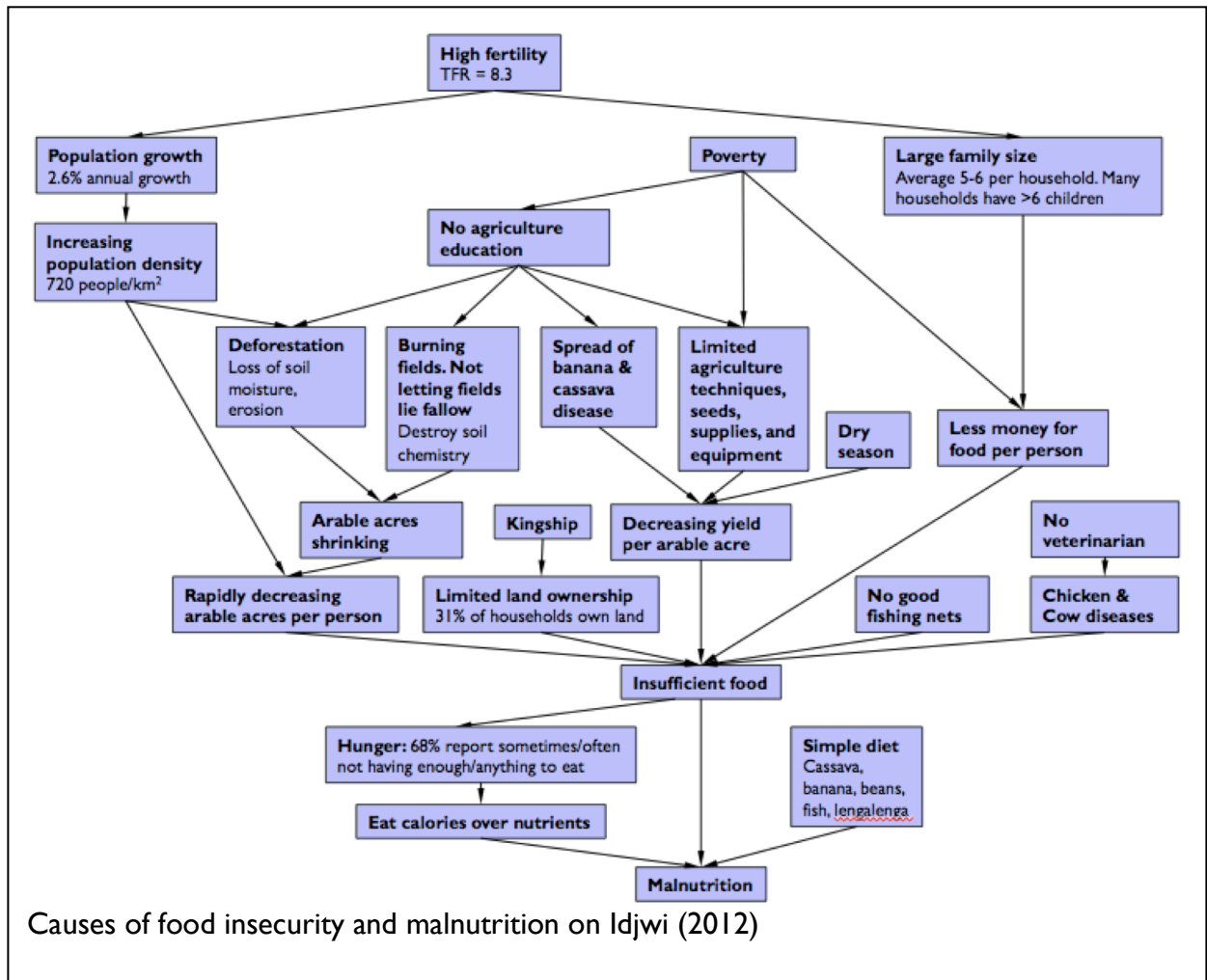
⁶⁵ OCHA IRIN Humanitarian News & Analysis (2012). DRC: "Banana Aids" threatens social fabric on Idjwi Island."

⁶⁶ OCHA IRIN Humanitarian News & Analysis (2012). DRC: "Banana Aids" threatens social fabric on Idjwi Island."

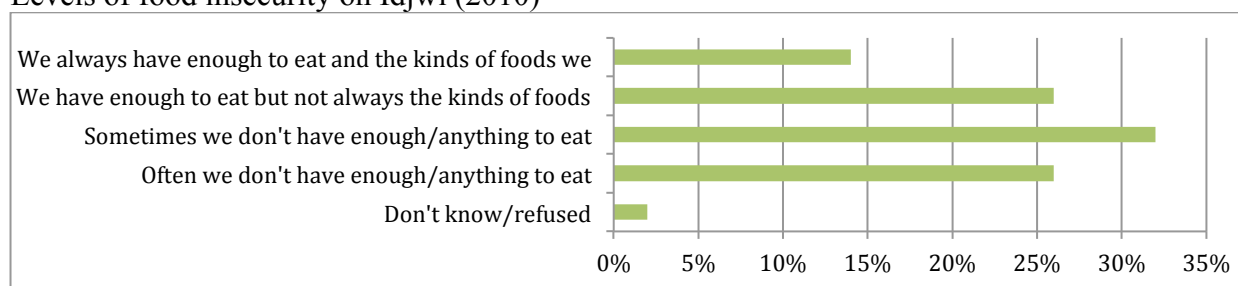
⁶⁷ OCHA IRIN Humanitarian News & Analysis (2012). DRC: "Banana Aids" threatens social fabric on Idjwi Island."

common during the dry season, which lasts from June to August. During this time, households in the South have severely restricted access to calorie dense crops like banana and cassava.

In 2010, only 14% of households always had the kinds of foods they want to eat. Foods rich in vitamin-A were often missing from the diet, yet only two-thirds of children under age 5 received a vitamin A dose in the six months prior to the survey. Most children exhibited symptoms of Kwashiorkor and intestinal parasites. Only 18% of children under age 5 had received an iron supplement in the last 7 days, and half of women received no iron supplements during pregnancy. The majority of mothers had experienced night blindness, and 7% of all neonates were born underweight, according to their mothers. In focus groups, most women agreed that men in a household get to eat more than women.



Levels of food insecurity on Idjwi (2010)



Food security, nutrition, and oral health statistics (2010)	
Percent of households that sometimes or often do not have enough to eat	52%
Percent of children under age 5 receiving no more than one meal per day	49%
Percent of children under age 5 receiving vitamin-A dose 6 months before survey	67%
Percent of mothers receiving any iron supplements during pregnancy	51%
Percent of neonates born underweight	7%
Percent of women age 18-50 currently experiencing oral pain	42%

3.5. Water, Sanitation, and Hygiene

3.5.1. Access to clean water. Local civic leaders estimate that 70% of households regularly use a clean source of water, usually a spring, well, or borehole. And approximately 30% of households use an unclean source of water. This matches the results of our survey, which suggested that 22% of households use river water and ~5% use lake water, which are both unclean. The mean and median total times to go, get water, and come back are 31 minutes and 15 minutes, respectively. Virtually all houses do nothing to make their water safer to drink.

3.5.2. Access to sanitation facilities. The majority of households (82%) use a pit toilet, the same proportion as the rural DRC population as a whole⁶⁸. On Idjwi, only 6 percent of households have access to a ventilated toilet that siphons waste away from the facility. Two thirds of households have their own toilet facility, while the rest typically share with 2 or 3 other households. A third of households use the lake for bathing, while 14 percent use their own facilities and the remainder use another household's or shared facility.

3.5.3. Waste disposal. 18 percent of households dump their trash in a public dump, while half of all households dump elsewhere. The remainder have it collected (22%), burn their garbage (5%), or bury it (3%). Most liquid waste is thrown in a gutter or creek running near the house.

3.5.4. Personal hygiene

Focus group polling suggested that most people believe handwashing is “very important” for their health (n=45). The Catholic church provides monthly trainings for handwashing that reach approximately 300 women per year. Soap costs 250Fc.

⁶⁸ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

3.5.4. Gastrointestinal illnesses. 38% of the youngest children in the household had diarrhea in the last two weeks, compared to 22 percent in rural DRC overall^{69,70}. Blood was reported in stools in one third of cases of diarrhea on Idjwi. Nearly all children with diarrhea were given something for their condition. One third were given a home remedy, 28% were given a form of ORS or RHS (compared to 47% in the DRC as a whole⁷¹), 20% were given a pill or syrup, and 11% were given an injection. Half of children had received medication for intestinal worms in the last six months.

3.6. Health Care

3.6.1. Infrastructure, staffing, supplies, and equipment. Idjwi is a single health zone, although its population is more than twice that of a typical DRC health zone. The zone is divided into 21 Health Catchment areas, often centering around a small health center. Local physicians have advocated to no avail for the island to be divided into two health zones and resourced accordingly.

Idjwi hosts three small hospitals. Hospitals are located in Kihumba and Bugarula (North Idjwi) and Monvu (South Idjwi). All hospitals are found on a road along the island's western shores. Consequently, many people, particularly those living in the east, have limited or no access to advanced care. Indeed, 7% of people reported having no access to health care. Monvu Hospital is the administrative center of Idjwi Health Zone, home to Idjwi's main pharmacy, and refers patients to Bukavu needing more advanced care.

A total of six physicians work on Idjwi: one in Kihumba, two in Bugarula, and three in Monvu. This suggests that there are approximately 2.6 physicians per 100,000 people, compared to 10 per 100,000 in DRC as a whole⁷². Physicians are paid a minimum of \$350 per month by AAP/CORDAID.

There are no obstetricians, pediatricians, surgeons, or other specialists. Hospitals report needing: more subsidies for care, additional specialized physicians, running water, electricity, ambulances, computers, internet, improved latrines, proper morgues, contraceptives, health education programming, nurse training, and basic equipment such as ultrasound, X-rays, diagnostics, surgical, and intensive care equipment

Idjwi also hosts approximately fifteen small health centers, which take responsibility for preventive medicine (including vaccinations), health messaging, and basic antenatal and perinatal health care. Some health centers employ community health workers, who perform vaccinations in the community, identify sick individuals for treatment, and provide health messaging about contraception, pregnancy, malnutrition, and malaria. Health centers are supplied irregularly with basic medications and often staffed only several days a week. The majority of health centers are inaccessible by vehicle. Areas served by *no* health center include the northern and southern tips of the island, as well as the central and eastern highlands around Nyamusisi. The majority of health centers have neither a refrigerator nor improved sanitation. Health centers report needing more subsidies for care, drugs, and nutritional supplements, better training for nurse staff, and materials for educating patients about HIV/AIDS and reproductive health

⁶⁹ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁷⁰ Note: this difference may be partially explained by an underrepresentation of 4-year-olds in our sample, who are less likely than younger ages to experience diarrhea.

⁷¹ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁷² World Health Organization. *World Health Statistics 2010*.

Each of Idjwi's facilities has a unique set of donors and political-social influences. The federal government currently provides no support for Idjwi's health services or infrastructure. The majority of funding for hospitals comes from user fees. Consultations at a hospital cost between \$2 to \$3.5. At a health center, they cost \$2 for an adult and \$1 for a child. A three-day stay at a health center costs \$15 for an adult and \$10 for children. These fees cover diagnostics, drugs, and basic treatments. Most people have difficulty paying these fees, especially with the current food crisis. Still, fees are expected to rise in the coming year because currently no NGOs are financing drugs. The poorest individuals are granted free health care.

Additionally, Bugarula hospital received 40% of its funding from AAP/CORDAID, and Kihumba and Monvu hospitals receive minority of their funding from the Catholic Church in Bukavu. AAP/CORDAID also funds some community health workers. Some hospitals and health centers receive funding for drugs from IRC/IHP. HEAL Africa has provided some reproductive care equipment to facilities in Northern Idjwi and occasionally sends physicians on brief missions to Idjwi. Health centers receive no user fees from patients, instead relying solely on assistance from AAP/CORDAID. Due to instability and insufficiency of funding and supplies, many health facilities are not fully operational.

Community-based health insurance is a rising trend on Idjwi. Mutuelle de Sante (contact above), a local insurance cooperative, now enrolls 14,500 Idjwi residents. Individuals can buy into the plan for \$3 per year, but some richer individuals pay more to cover the expenses of vulnerable populations, such as widows, orphans, and the poor.

3.6.2. Health education & health-seeking behavior. When sick or seeking advice on their health, three fifths of respondents visit their closest *Centre de Santé*, a small rural health post. Of the remainder, 11 percent visit a local pharmacy or shop, 6 percent travel to one of the island's three hospitals, and 2 percent each visit a traditional healer or family member. In the last year, three quarters of female respondents visited a health center, clinic, or hospital. The most common reasons for seeking health care was a medical condition, followed by reproductive health care needs.

15 percent of women go nowhere for health care. For this subpopulation, the limiting factors were distance or lack of transportation (58%), cost (39%), or the facility being closed (6%). Similar problems in accessing health care are present in rural DRC as a whole, the most prohibitive being cost (83%), transportation problems (59%), and distance to health facility (54%)¹¹⁵.

68% of female respondents expressed that there are actions they should take to further improve their health. The most commonly cited activities are religion and praying (28%), medical treatment (26%), change in diet or eating habits (16%), learning to manage stress (8%), herbs (7%), vitamins (5%), reducing stress (5%), and increasing drinking water (4%). 54% of women have taken one or more of these actions in the last 3 months.

3.7. Child health⁷³

3.7.1. Rates & risk factors. There was significant under-reporting of infant and child death. This is unsurprising, since when young children die on Idjwi, the mother is held responsible, scorned, and considered lazy⁷⁴. Under-reporting makes impossible an accurate calculation of

⁷³ We are currently waiting on the Health Zone Director to provide estimates of stunting, wasting, kwashikor, infant mortality rate, <5 mortality rate, and childhood vaccination rates.

⁷⁴ Carael, M & J Stanbury. *Promotion of Birth Spacing on Idjwi Island, Zaire*. Studies in Fam. Plann (1983); 14,5:134-142.

infant and child mortality. Premature infants always die on Idjwi because health centers have no neonatology equipment. The infant mortality rate is unlikely to be any better than that of the DRC as a whole: 78.4 deaths per 1000 live births⁷⁵.

3.7.2. Vaccinations and preventive care. Two thirds of the youngest children in the household had received vaccinations to common infectious diseases. Two thirds had received a vitamin A dose in the last six months and 18% had received an iron supplement in the last 7 days.

3.7.3. Health-seeking behavior. Mothers sought advice or treatment for their youngest child in 32% of cases of diarrhea, fever, or cough. Of these, two-thirds seek help from a trained health professional and one fifth visit a pharmacy or shop.

3.7.4. Malnutrition and oedema (data from 2010). Nearly all children had eaten the day before the interview, but only half had more than one meal. 7 percent of all neonates were underweight at birth, compared to 8.7 percent in rural DRC as a whole⁷⁶.

3.7.5. Diarrhea & gastrointestinal illnesses. Over one third (38%) of the youngest children in the household had had diarrhea in the last two weeks, compared to 22% in rural DRC overall⁷⁷. Blood was reported in stools in one third of cases of diarrhea on Idjwi. Nearly all children with diarrhea were given something for their condition. One third were given a home remedy, 28% were given a form of ORS or RHS (compared to 47% in the DRC as a whole⁷⁹), 20% were given a pill or syrup, and 11% were given an injection. Half of children had received medication for intestinal worms in the last six months.

3.7.6. Respiratory infections. In the two weeks prior to the interview, over half (59%) of the youngest children in the house had a high temperature, and a similar amount (62%) had suffered from cough. Nearly half (49%) had suffered from both fever and coughing, compared to 37 percent in rural DRC overall⁸⁰. In 90% of cases, coughing was associated with some difficulty breathing, caused by blockage of the nose (17%), chest (25%), or both nose and chest (56%). 42% of children took some form of medication for their illness.

Respiratory infections may be exacerbated by the burning of solid fuels. 9 out of 10 households use wood for cooking, and the remainder using charcoal, the same proportions of the rural DRC population as a whole⁸¹. On Idjwi, a third of households cook indoors, and 73% of these households have neither a chimney nor a hood to direct smoke outside.

⁷⁵ CIA World Fact Book (2011). <https://www.cia.gov/library/publications/the-world-factbook/>

⁷⁶ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁷⁷ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁷⁸ Note: this difference may be partially explained by the underrepresentation of 4-year-olds in our sample, who are less likely than younger ages to experience diarrhea

⁷⁹ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁸⁰ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁸¹ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

Child health statistics

Medical Conditions	
Children experiencing diarrhea in the two weeks prior to the interview	35%
Children experiencing diarrhea with blood in the stools in the two weeks prior to the interview	11%
Children experiencing diarrhea in the two weeks prior to the interview who received ORS or RHS	28%
Children experiencing high temperature in the two weeks prior to the interview	59%
Children experiencing difficulty breathing from chest blockage in the two weeks prior to interview	48%

Preventive Care & Health-Seeking Behavior	
Children receiving vaccinations to common infectious diseases	68%
Mothers seeking advice or treatment from skilled health worker for child's diarrhea, fever, or cough	22%
Children receiving a vitamin A dose in last 6 months	67%
Children receiving an iron supplement in last 7 days	18%
Average number of months newborn is breastfed (estimation)	10.4
Children receiving deworming medication in last 6 months	49%

Risk Factors	
Mothers reporting sometimes not having enough to eat	61%
Percent of birth underweight	7%
Infants (age <1) being breastfed	96%
Households with access to improved drinking water	2%
Households with access to improved sanitation	6%
Percent of households home to a child with an absent or deceased parent	34%
Percent of children having only no more than 1 meal the day before the interview	49%

3.8. Reproductive Health⁸²

3.8.1. Rates & risk factors. In 2009, Idjwi's maternal mortality rate was reportedly greater than 1500/100,000⁸³. High maternal mortality on Idjwi is associated with high fertility, early age of first birth, malnutrition, and poor health infrastructure, staffing, and supplies. Indeed, two-thirds of women reported some difficulty with vision during pregnancy, particularly night blindness, suggesting that nutritional deficiencies are common during pregnancy.

Contraception	
Unmet need for contraception	54.8%
Currently using a modern method of contraception (estimated)	1.0%
Ever used a modern method of contraception	6.5%
Ever used a traditional method of contraception	3.7%

⁸² Research ethics committees required that only "adults" be interviewed. In DRC, the legal age of adulthood in the DRC is 18, so mothers under age 18 were not interviewed. This restriction may create biases, since teen mothers in similar settings have greater reproductive health needs and poorer social, economic, and health outcomes than adults. Although the statistics presented here are bleak, reproductive health needs on Idjwi may be even greater than those stated here.

⁸³ Amani Global Works. *Idjwi Island Preliminary Assessment*, 2009.

3.8.2. Fertility & Family Planning. Total fertility rate (TFR) on Idjwi is 8.3 births per woman, as calculated using age-specific fertility rates from reported births in the last 36 months⁸⁴. This is substantially higher than the DRC's overall TFR of 5.25. Still, true fertility may be even higher on Idjwi, since the birth of dead infants was probably under-reported. The crude birth rate was 65 births per 1000 individuals (averaged over two years prior to the survey), which is higher than the crude birth rate of 38/1000 in the DRC overall⁸⁵. Female literacy was associated with lower fertility.

Fertility is extremely high on Idjwi for several reasons. Carael and Stanbury found that on Idjwi, a fertile woman can look forward to social integration and respect, while an infertile woman may be treated as an outsider and rejected⁸⁶. Children are needed to work in the fields and can act as social insurance⁸⁷, since male offspring can extend a family's agricultural domain through patrilineal succession and female offspring receive a large bride price upon marriage. Additionally, women's reproductive lives start early on Idjwi. The average age at first intercourse was 16.8 and median age of first birth was 18 years, compared with 19.6 years in rural DRC⁸⁸. The average breastfeeding period is just 6 months, suggesting that women do not breastfeed to delay pregnancy⁸⁹. Mean birth spacing on Idjwi was 21 months, compared with 30 months in rural DRC⁹⁰.

54.8% of women age 18-50 on Idjwi have an unmet need for contraception⁹¹, compared to 24% in rural DRC⁹². Only 6.5% of women on Idjwi have ever used a modern method of contraception, and even fewer have used withdrawal (2.5%) or the calendar method (3.7%) to delay or avoid pregnancy⁹³. Only 14% of women reported that a health worker talked to them about family planning in the last year. Other major barriers include high cost (19%), no knowledge of source (19%), no knowledge of method (17%), and husband/partner opposed (16%), and fear of side effects (12%). In multiple focus groups, each gender blamed the other for wanting to have many children. Additionally, Idjwi's Catholic Church leaders express that "unnatural" forms of contraception are forbidden, which may strongly influence the preferences of half the population.

In the vast majority of relationships (85%), the husband/partner makes decisions about his wife's health care, restricting a woman's ability to use family planning services as desired. *The vast majority of women are unfamiliar with options to control their fertility, and socially disempowered to make decisions about their own reproductive health. Indeed, illiteracy among women correlates strongly with high fertility in our data.*

High fertility has dire consequence on Idjwi. There is insufficient land to feed the growing population, particularly given current crop epidemics. Growing population, therefore, is a direct cause of childhood malnutrition and increasing social instability. Additionally, poor

⁸⁴ Thomson, Dana. *Fertility and Unmet Need for Contraception on Idjwi Island, D.R. Congo*. Master's Thesis, Department of Global Health & Population, Harvard School of Public Health.

⁸⁵ CIA World Fact Book (2011). <https://www.cia.gov/library/publications/the-world-factbook/>

⁸⁶ Carael, M & J Stanbury. *Promotion of Birth Spacing on Idjwi Island, Zaire*. *Studies in Fam. Plann* (1983); 14,5:134-142.

⁸⁷ Carael, M & J Stanbury. *Promotion of Birth Spacing on Idjwi Island, Zaire*. *Studies in Fam. Plann* (1983); 14,5:134-142.

⁸⁸ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁸⁹ Lucas, D & P Meyer. *Beginning Population Studies*. National Center for Development Studies (1994).

⁹⁰ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁹¹ Thomson, Dana. *Fertility and Unmet Need for Contraception on Idjwi Island, D.R. Congo*. Master's Thesis, Department of Global Health & Population, Harvard School of Public Health.

⁹² MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

⁹³ Of women who have ever used a modern method, most have used pills (50.6%) or injectables (40.3%). If beginning contraception, most women would prefer to use either injections (26.5%) or pills (25.4%).

families with many children often cannot afford to send everyone to school. Consequently, girls are frequently deprived of an education, perpetuating women's disempowerment.

3.8.3. Antenatal care. 62% of respondents had received some form of antenatal care from trained health personnel, either a nurse/midwife (52%) or physician (10%). One quarter of pregnant women received four or more antenatal care checkups. On antenatal care measures, Idjwi performs worse than DRC as a whole, where 85% of mothers received antenatal care from skilled health personnel, and 47% received four or more antenatal checkups⁹⁴. On Idjwi, women reported receiving a variety of medications during pregnancy, including tetanus vaccine (61%), deworming medications (43%), antimalarials (40%), and an average of two doses of iron supplements (52%). Immunization of mothers against tetanus was similar to rural DRC as a whole, where 59 percent of pregnant women received tetanus vaccination⁹⁵. At many health centers, a woman who is having her first pregnancy receives an ITN provided by UNICEF.

3.8.4. Intrapartum care. 60 percent of women gave birth in a health facility, compared to 61 percent in rural DRC⁹⁶. For those not delivering in a health facility, the most common reasons were distance to the health facility or lack of transportation (43%) and cost (34%). Two thirds of deliveries were assisted by trained health personnel: 57% by a nurse/midwife and 11% by a physician, the same proportion as in rural DRC overall⁹⁷. The remainder relied on traditional birth attendants or community support. See the map below for a geographic distribution of this data. HEAL Africa recently began an MMR program in Northern Idjwi that gave some delivery equipment to health centers. The program also pays traditional birth attendants to bring women to a health center, rather than deliver in the field.

3.8.5. Postnatal care. Although almost all women received some form of check-up an hour or more after delivery, less than one quarter (24%) received a check-up more than 24 hours after delivery. Check-ups were typically performed by nurses/midwives (55%), doctors (11%), or traditional birth attendants (26%).

3.8.6. Unsafe abortions. It is common on Idjwi for young women to become pregnant before marriage. Because of the ensuing stigma, and the requirement that the woman marry the father, many women desire to have abortion. Abortions, however, are illegal in the DRC and are not offered at any health center on Idjwi. Women, therefore, perform unsafe abortions, which often lead to severe complications and death.

Reproductive Health	
Median age at first birth	17.6
Months exclusively breastfed last child	6.1
Total months breastfed last child (estimated)	10.4
Average birth interval (in months)	21
Average number of antenatal visits	2.7
Percent of women who had at least one antenatal visit	88.4%
Percent of women who had at least four antenatal visits	25.0%
Percent of births attended by a skilled health worker	66.0%
Percent of women who received tetanus shot during last pregnancy	60.7%
Percent of women suffering night blindness during last pregnancy	64.5%

⁹⁴ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo.*

⁹⁵ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo.*

⁹⁶ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo.*

⁹⁷ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo.*

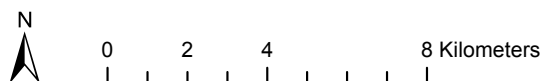
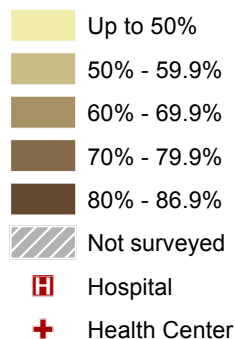
Percent of births attended by a skilled health worker

By Health Catchment Area*, Idjwi, DRC

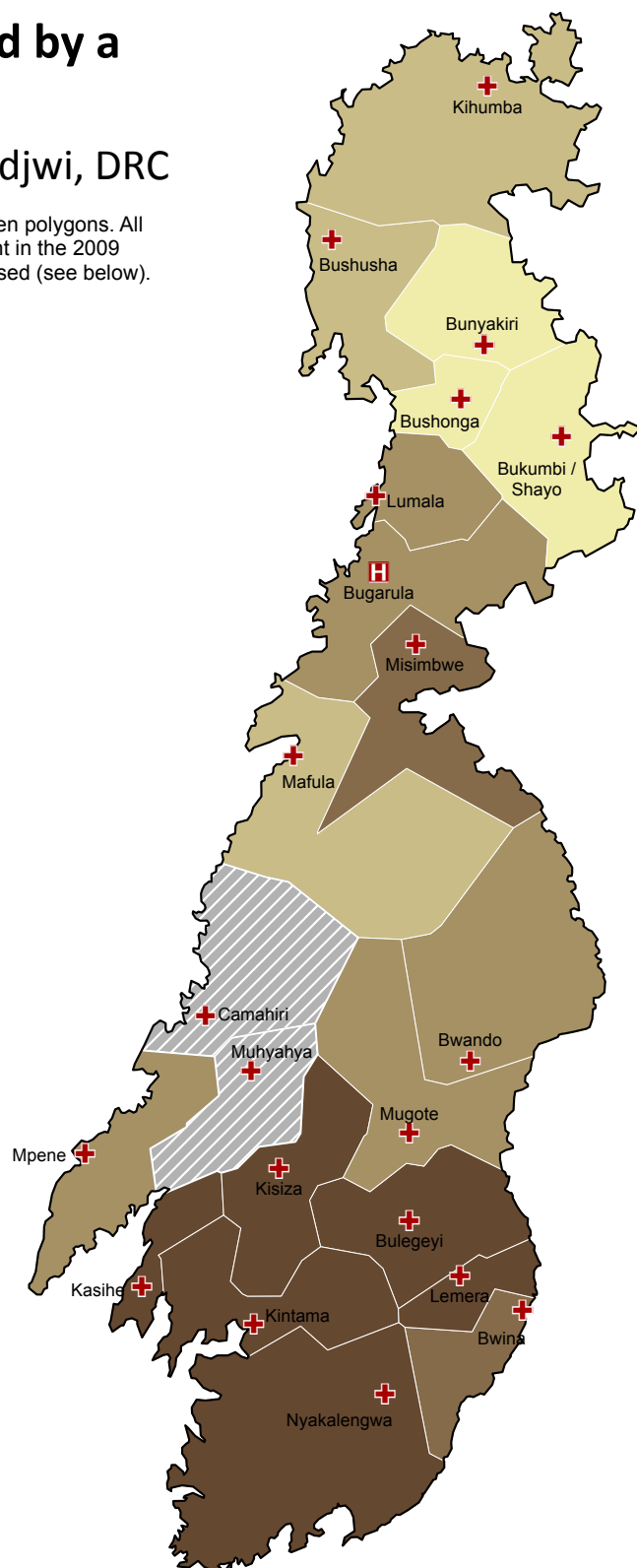
*Health Catchment Areas are approximated using thiesen polygons. All facilities that were reported as having a patient catchment in the 2009 Health Report by the Idjwi Central Health Bureau were used (see below).

Shape *	Name	2009 Catchment Pop
Point	Bugarula	14,200
Point	Bukumbi / Shayo	10,110
Point	Bulegeyi	14,500
Point	Bunyakiri	11,693
Point	Bushonga	6,608
Point	Bushusha	8,319
Point	Bw ando	8,230
Point	Bw ina	6,299
Point	Camahiri	10,291
Point	Kasihe	4,873
Point	Kihumba	12,190
Point	Kintama	10,082
Point	Kisiza	9,733
Point	Lemera	6,404
Point	Lumala	7,426
Point	Mafula	6,979
Point	Misimbwe	8,172
Point	Mpene	8,951
Point	Mugote	13,176
Point	Muhyahya	9,240
Point	Nyakalengw a	15,825

Skilled Attendant



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3.9. Infectious Diseases

3.9.1. HIV/AIDS and other STIs: Local physicians estimate the HIV seroprevalence to be 3-5% and stable. High risk individuals include soldiers and migrant workers. Only one hospital, Bugarula, provides ARTs. 44 patients currently take ARTs, out of 150 on file. ARTs are paid for by BDOM. Bugarula hospital also provides messaging about HIV prevention via Idjwi's radio station and offers free condoms.

The spread of the disease through the population seems likely. One third of women report having more than one sexual partner in life. 15% of all women, and 11% of married women, reported having more than one sexual partner in the last 12 months. 86% of women believe that most men have sex with multiple partners, regardless of the man's marital status, and fewer than 5% of women have ever used a condom. Additionally, many women appear to be coinfecting with other sexually-transmitted infections, which increases HIV transmission: In the past year, two-thirds of women experienced a genital sore or wound, and 43% of women experienced a bad-smelling, abnormal genital discharge.

Nearly all respondents (95%) have heard of AIDS, but only 29% know of a testing facility and only 28% are aware of modern treatments. Most respondents believe they could reduce their chance of HIV infection by using a condom during sex (74%), having sex with just one partner (87%), or practicing abstinence (71%). Similarly, four-fifths of respondents know that it is possible for a mother to transmit AIDS to her baby. However, less than half (45%) receive education about AIDS during antenatal care visits. And a substantial fraction still believe it possible to contract AIDS via mosquito (24%), shared food (19%), or sorcery (15%). AIDS is stigmatized on Idjwi.

A stigma persists around HIV. The majority of women (53%) would not buy fresh vegetables from a shop keeper known to have the AIDS virus. Also, 30% responded that if a member of their family contracted AIDS, they would want it to remain a secret. CPR, Idjwi's leading civic organization, is trying to begin a therapy group for HIV+ men, but there is too great a stigma for men to enroll.

3.9.2. Malaria. Malaria is endemic to Idjwi, and most respondents (92%) reported contracting the disease at some point in their life. Half of respondents reported that there are puddles or places of open water near their house (potential mosquito breeding grounds). Diagnosis was made by trained health care personnel for only 54 percent of respondents reporting malaria. Only 59 percent of respondents completed a full course of prescription medication, and 27 percent received no prescription medication whatsoever.

Regarding prevention, 17% of all households were observed by interviewers to have an insecticide-treated bed net (ITN). This is somewhat higher than the 7% of households with ITNs in DRC as a whole⁹⁸. In most households with mosquito nets on Idjwi, respondents reported that someone had slept under the ITN the night before the interview. However, nearly all respondents (95%) reported that they took no personal precautions to protect themselves from malaria or mosquito bites. One third of all respondents did not know that mosquitoes were the primary vector, often attributing the disease instead to dirty water.

3.9.3. Tuberculosis. Almost all respondents (95%) had heard of tuberculosis. Mechanisms of transmission were fairly well understood: 88% knew that the disease could be spread through the air when coughing or sneezing. However, only three-fifths knew that tuberculosis is curable, and

⁹⁸ MEASURE DHS (Macro Int). *Demographic & Health Survey 2007 - Democratic Republic of the Congo*.

17% expressed that it was incurable. 24% responded that if a member of their family contracted tuberculosis they would want it to remain a secret.

3.9.4. Oral infections. Oral infections are a known risk factor for a variety of infectious and chronic diseases. Over half of respondents (54%) have had a problem with oral pain at some time in their life, and 42% are currently experiencing oral pain. Of those with current pain, 82% report that their suffering has prevented them from doing a normal activity at least once in the past 3 months. For those with current pain, one third seek care from a health professional, 11% seek care from a traditional healer, 33% attempt self-remedy, and a quarter do nothing. Respondents clean their teeth either more than once a day (37%), about once a day (47%), every few days (8%), every few weeks (4%), or never (4%). For those cleaning their teeth, the preferred methods are toothbrush alone (35%), toothbrush and toothpaste (30%), or chewstick (29%). There is no dentist on the island. Some nurses attempt to extract teeth, but often experience complications.

4. PROGRAM RECOMMENDATIONS

The following list of priority program areas arises from an integration of expressed community priorities, human rights violations, and mapping of the root causes of unfreedom and poverty on Idjwi. Programs must target first those who currently receive services last.

- a) **Food aid/security** via resistant crops/seeds, community messaging around prevention of banana/cassava disease, agriculture skill-training, meals for malnourished families.
- b) **Empowerment of Batwa** via equitable land ownership, community messaging, enforcement of nondiscrimination, and access to justice.
- c) **Empowerment of women** via education, skills-training, employment, family planning, security, and a strong and accessible justice system. Community education around SGBV, human rights, and women's empowerment. Protection of women against reproductive illnesses and sexual- and gender-based violence. Response to the legal, medical, and psychosocial needs of survivors.
- d) **Empowerment of families** via family planning, equitable land ownership, skills training (particularly around agriculture and livestock), resistant and nutritious crops.
- e) **Protection of vulnerable children** against abuse, neglect, and malnutrition, including emergency food rations during the current crop epidemic.
- f) **Population control** via access to family planning, education about increased birth spacing and the benefits of small families, influencing religious leaders, and reduction in infant mortality.
- g) **Increased financing of health care**, including: community health education programs and health messaging; more specialized physicians; better nurse training; improved water and sanitation; electricity; ambulance; drugs, supplies, and basic life-saving equipment.
- h) **Infrastructure improvements**, including electricity, clean water, roads (particularly to health centers and ports), schools, government/justice buildings, and community centers.
- i) **Community messaging** around preventing the spread of crop diseases via poor agricultural practices. Government-sponsored controls of environmental degradation.